

Revision 2020



Ophthalmology Academic Staff *2019 - 2020*

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*Dr Horia AlAnsi

*Dr Samiha AlEryani

*Dr Amal Noman (RIP)

Good Luck for all students



الفاتحة

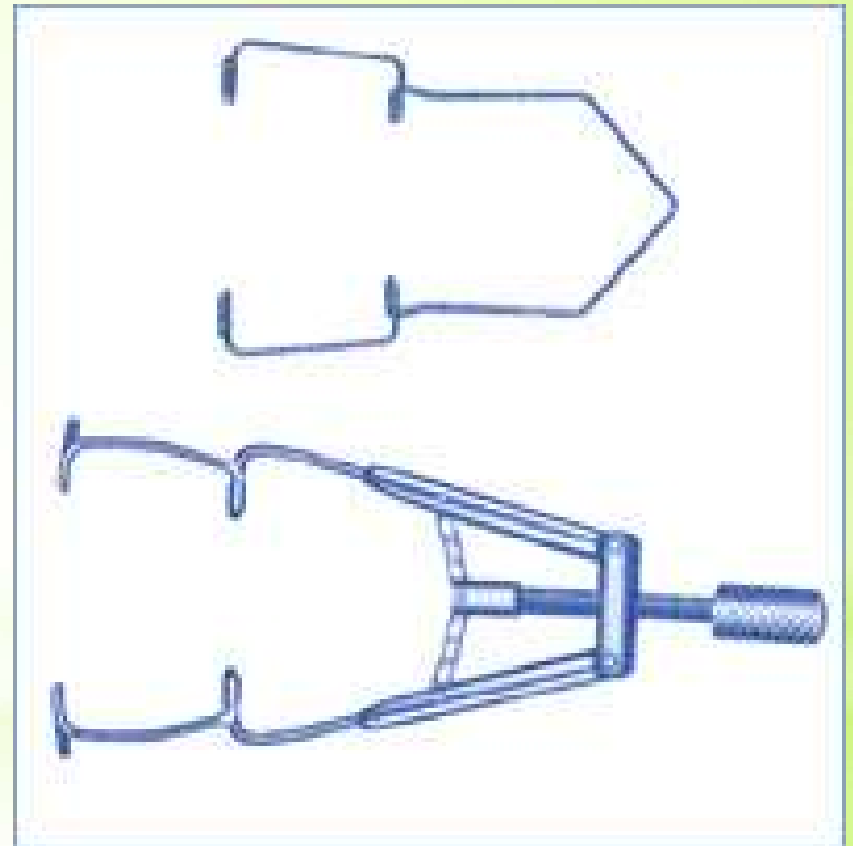


Surgical Instruments

Prof. Mahfouth A Bamashmus
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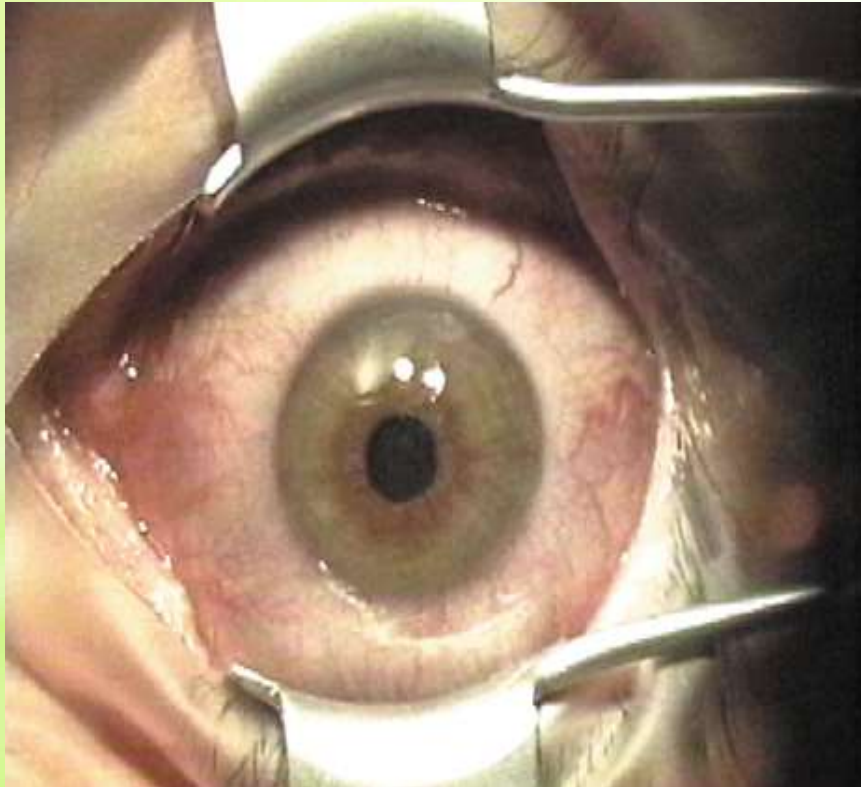
Speculum

Used to retract the lids in ocular operations



Speculum

Used to retract the lids in ocular operations



Desmarre's Lid Retractor

Produces eversion of upper lid



Desmarre's Lid Retractor

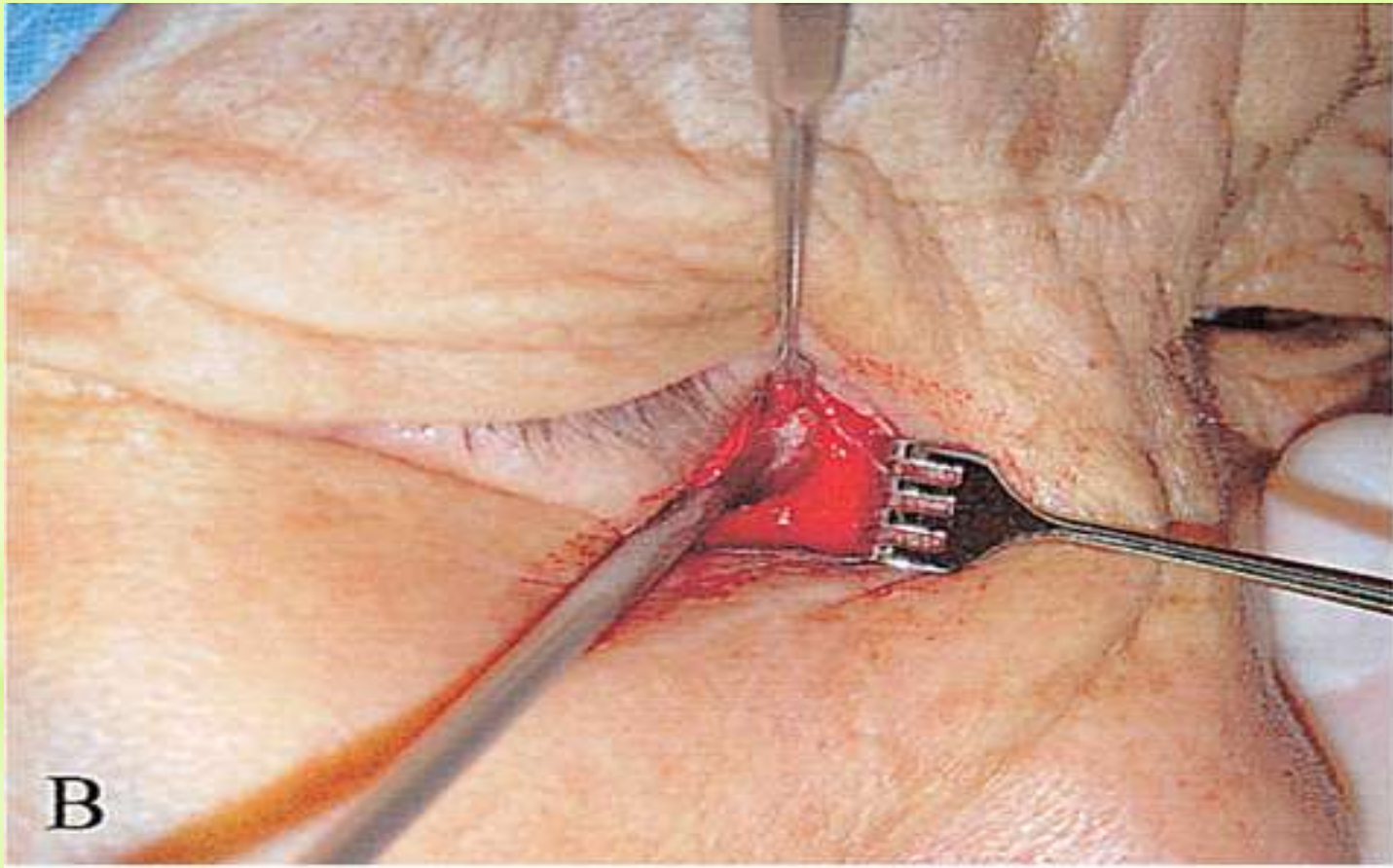
Produces eversion of upper lid



Lacrimonal Retractor



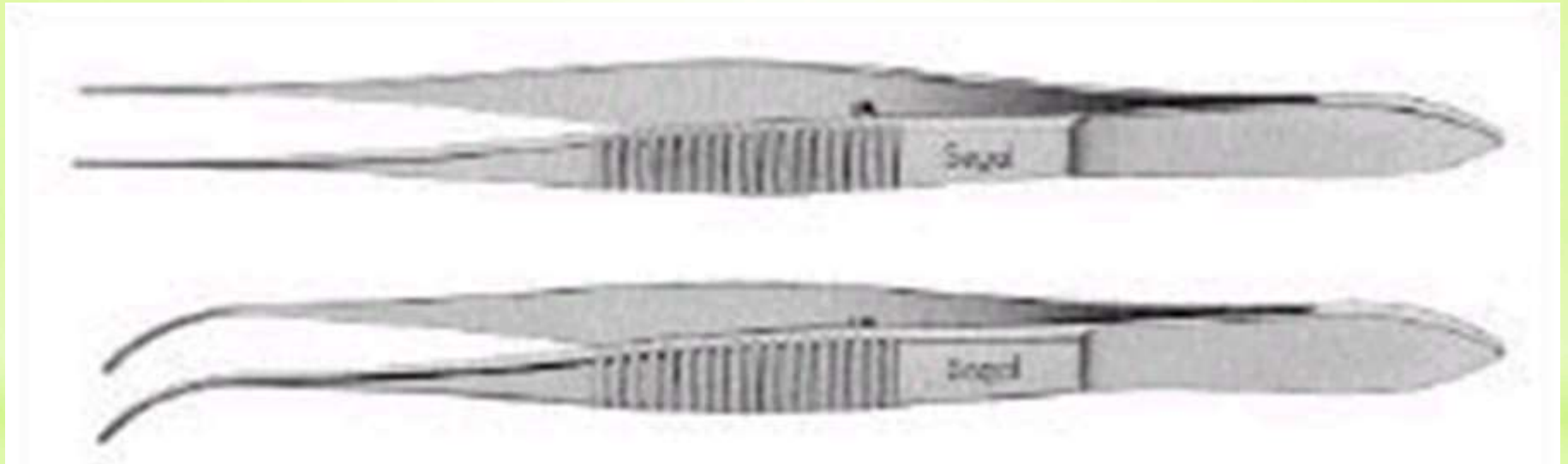
Lacrimal Retractor



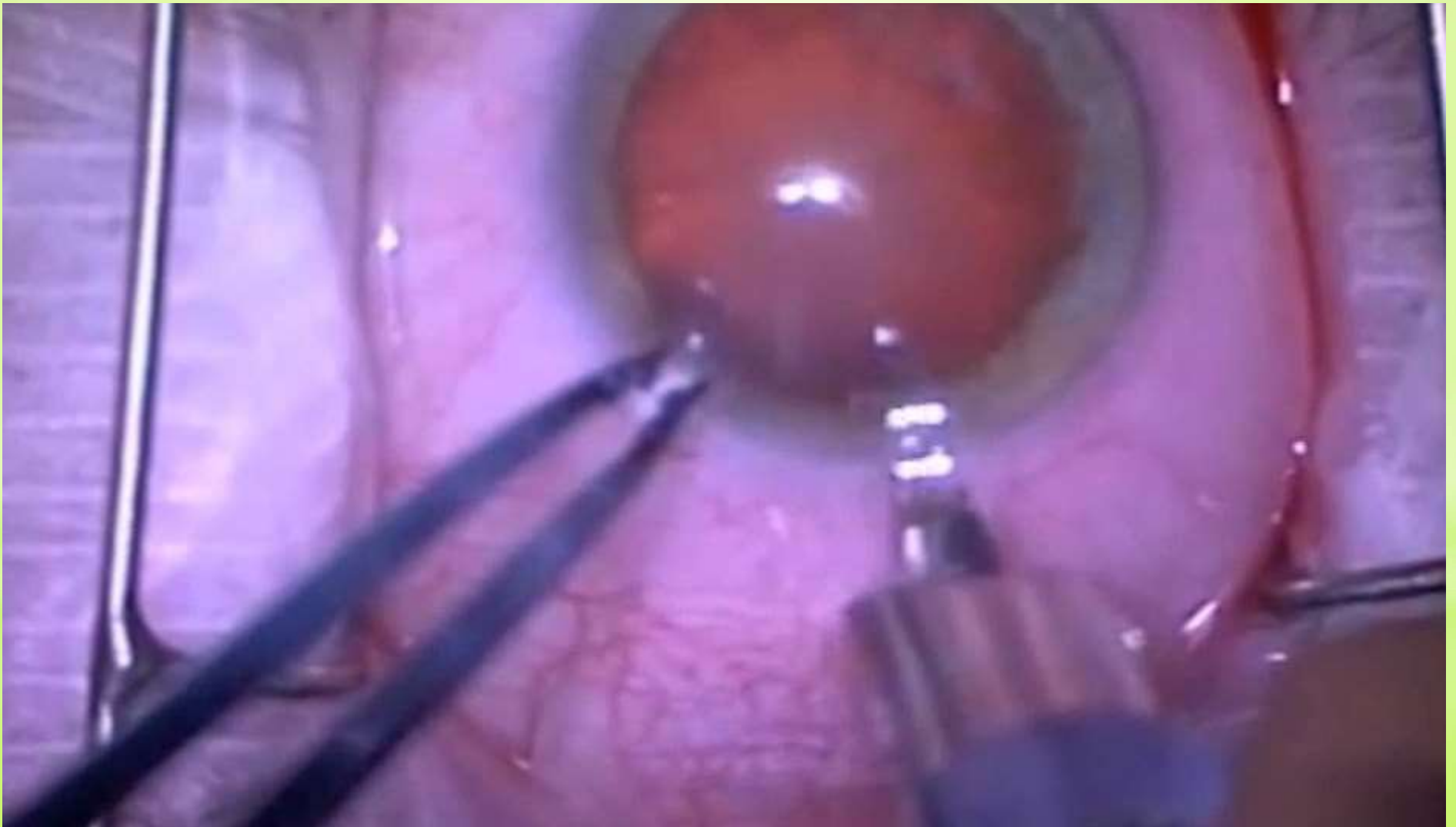
FORCEPS

- * Corneal Fixation Forceps
- * St Martin Tooth Forceps
- * Colibri Forceps
- * Mc Pherson Tying Forceps
- * Capsulorrhexis Forceps
- * Chalazion Forceps

Corneal Fixation Forceps



Corneal Fixation Forceps



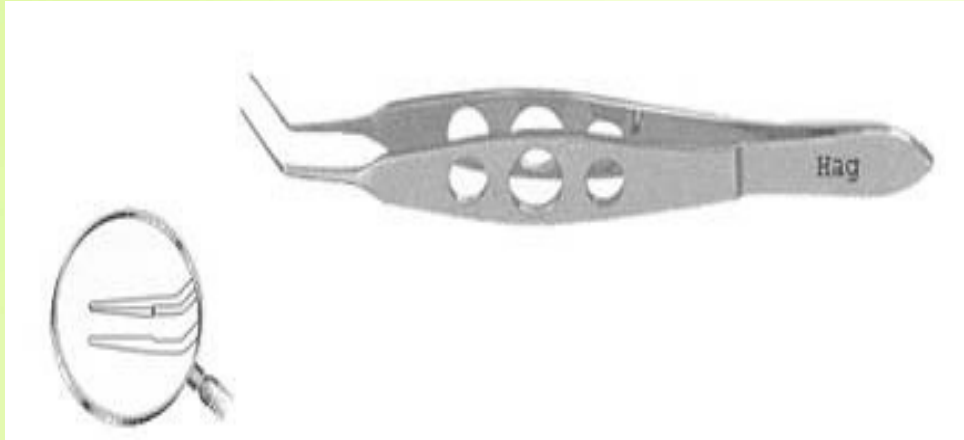
St Martin Tooth Forceps



Colibri Forceps



Mc Pherson Tying Forceps



Capsulorrhexis Forceps



Chalazion Forceps



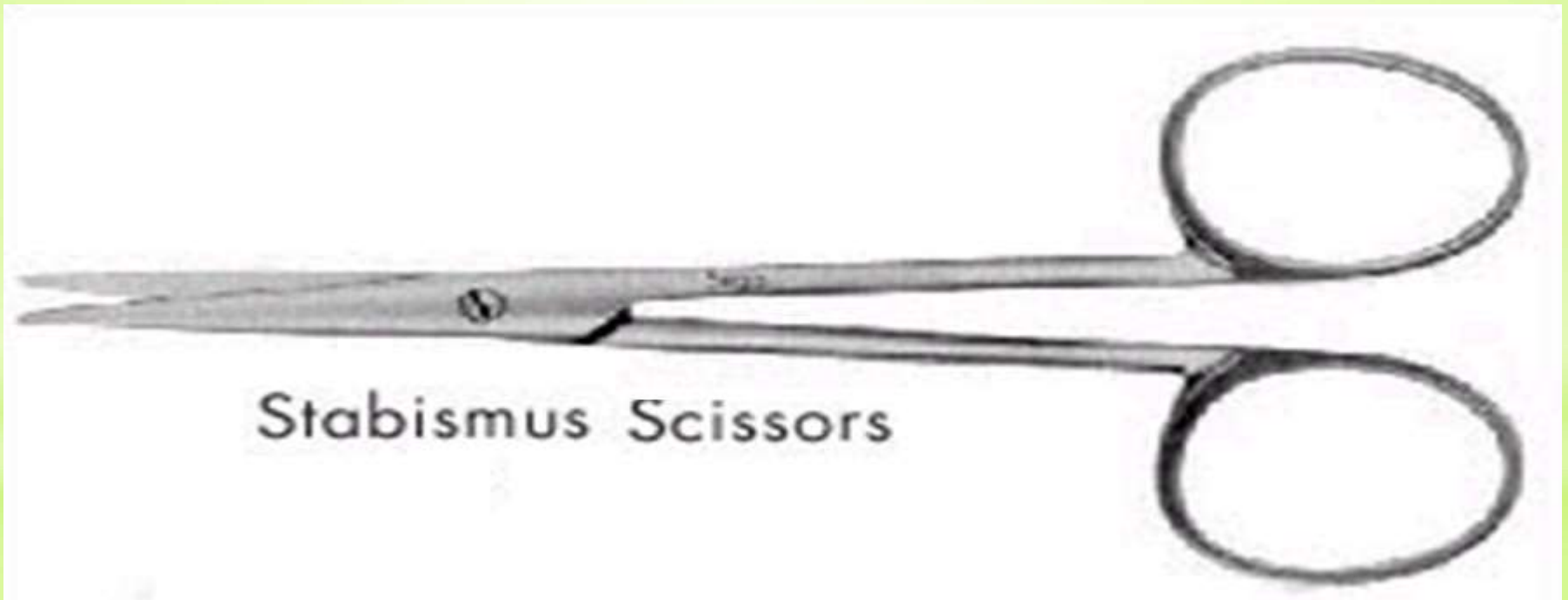
Chalazion Forceps



Scissors

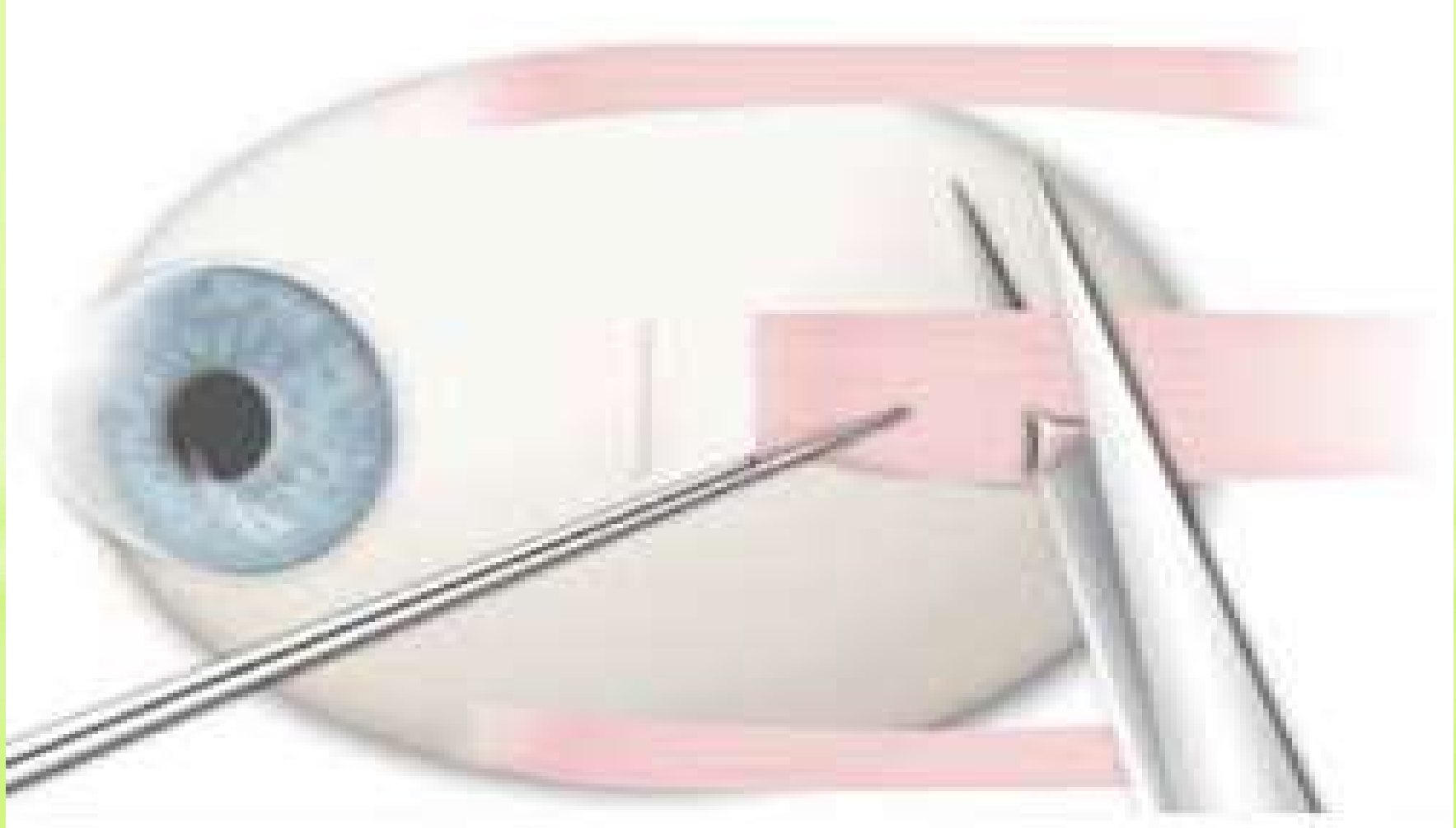
- * Strabismus Scissors
- * Enucleation Scissors
- * Westcott's Corneal Scissors
- * Catroviejo Corneal Scissors
- * Vannas Scissor

Strabismus Scissors



Strabismus Scissors

Muscle Resection Procedure



Enucleation Scissors



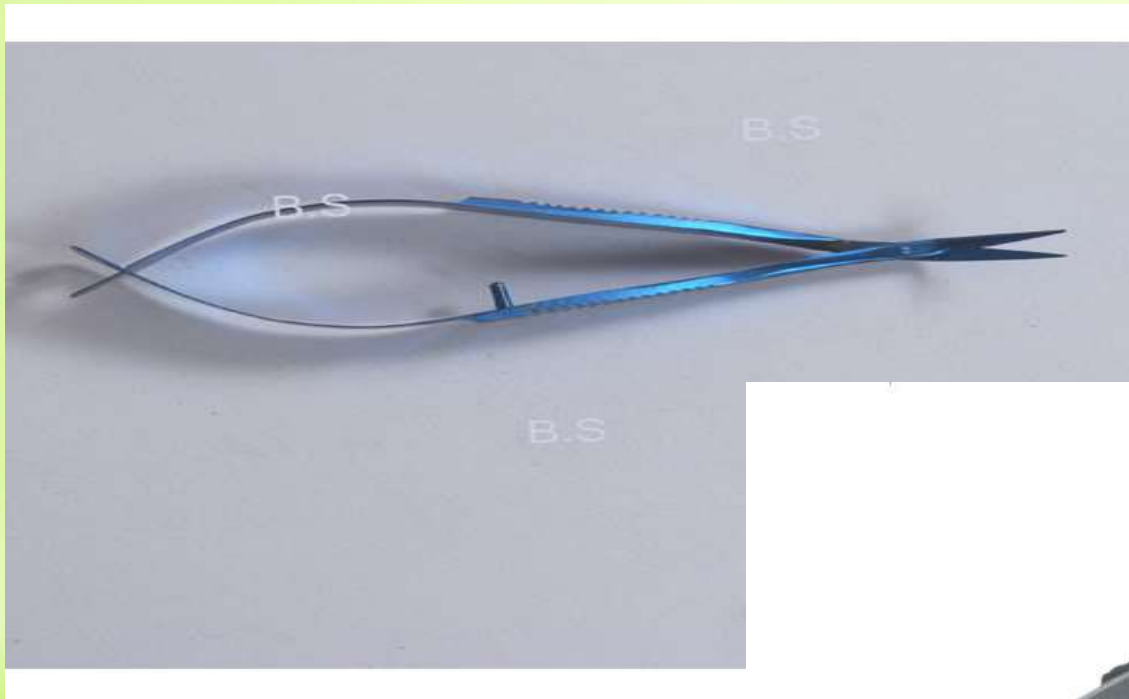
Westcott's Conjunctival & Corneal Scissors



Catroviejo Corneal Scissors



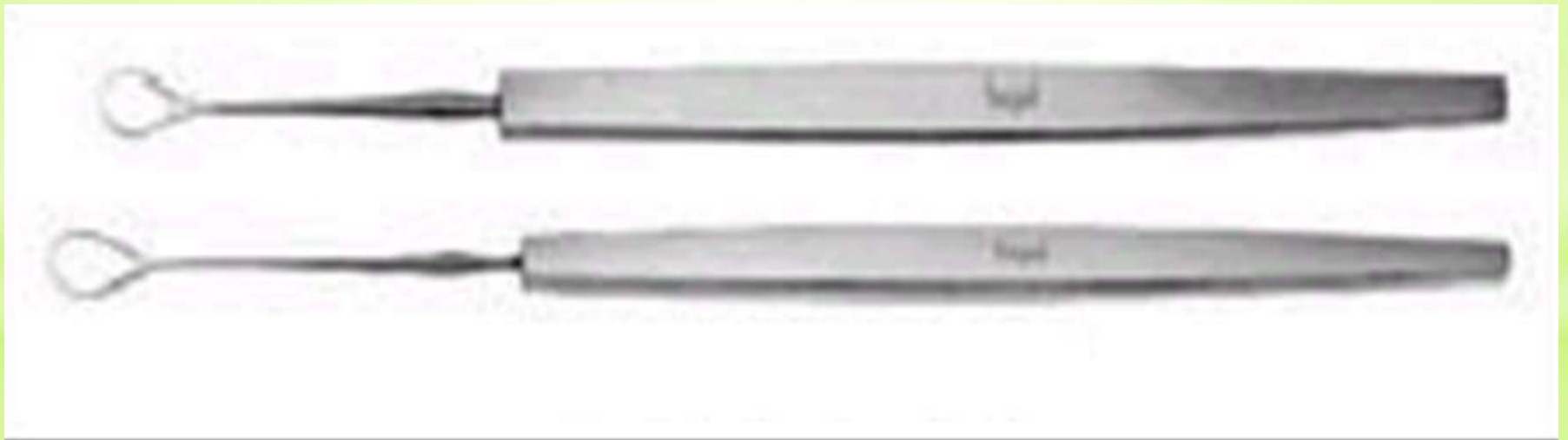
Vannas Scissor



Needle Holders



Lens Scoops



Chalazion Scoop



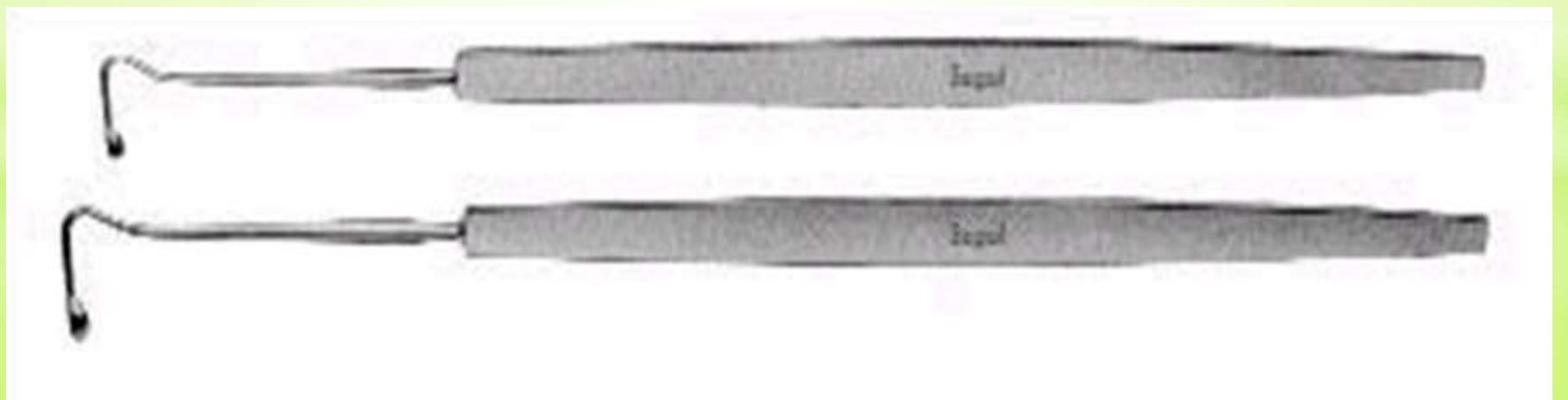
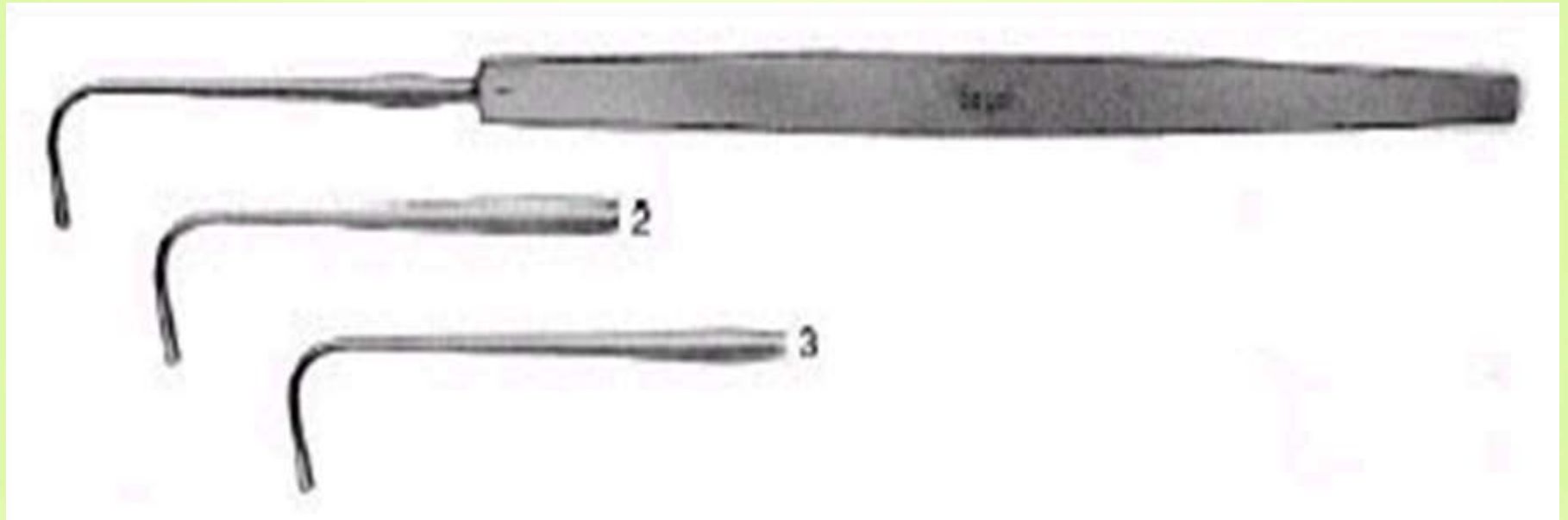
Calipre

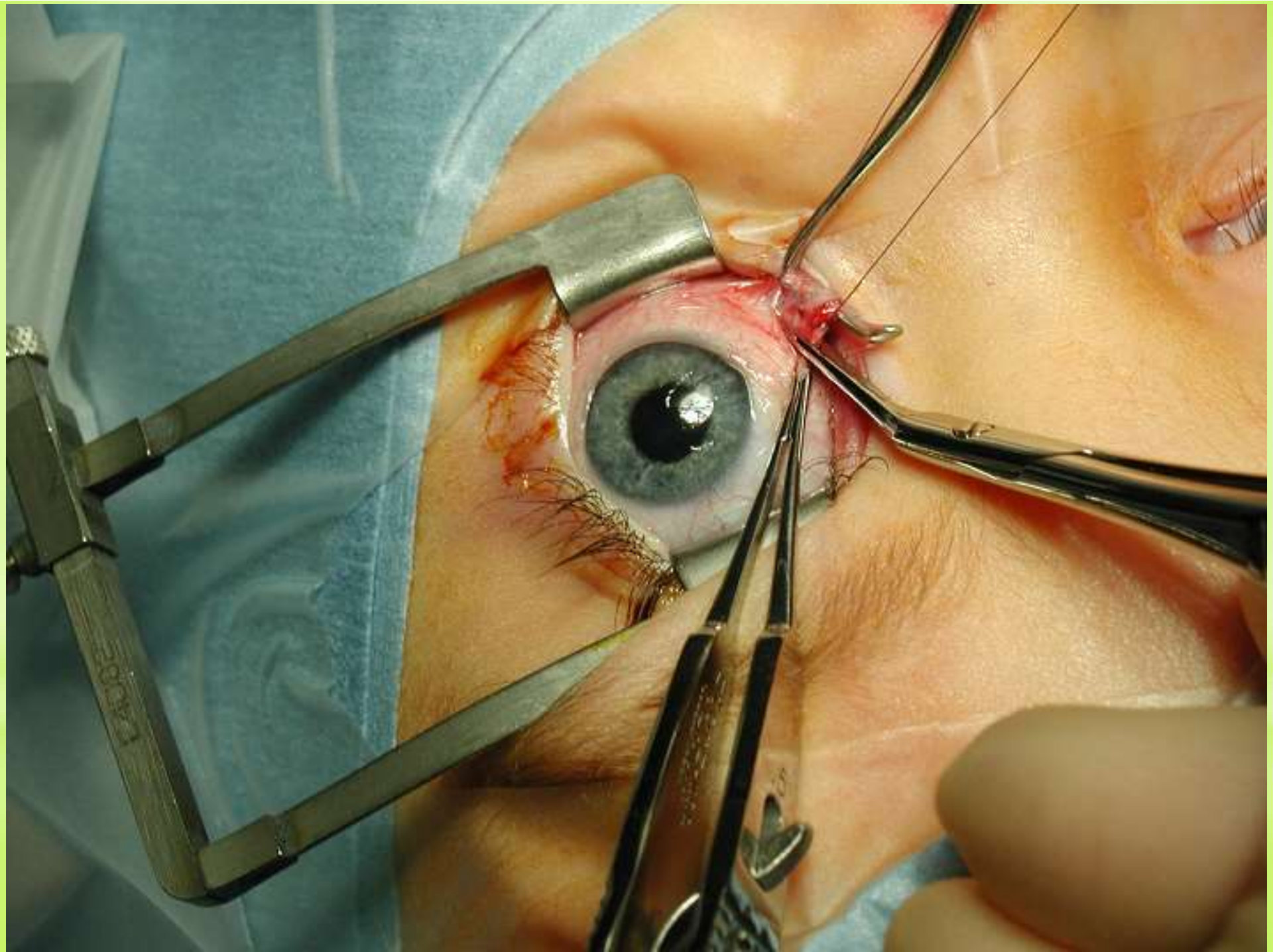


Calipre



Strabismus Muscle Hook





Shepard IOL Insertor



Clayman IOL Forceps



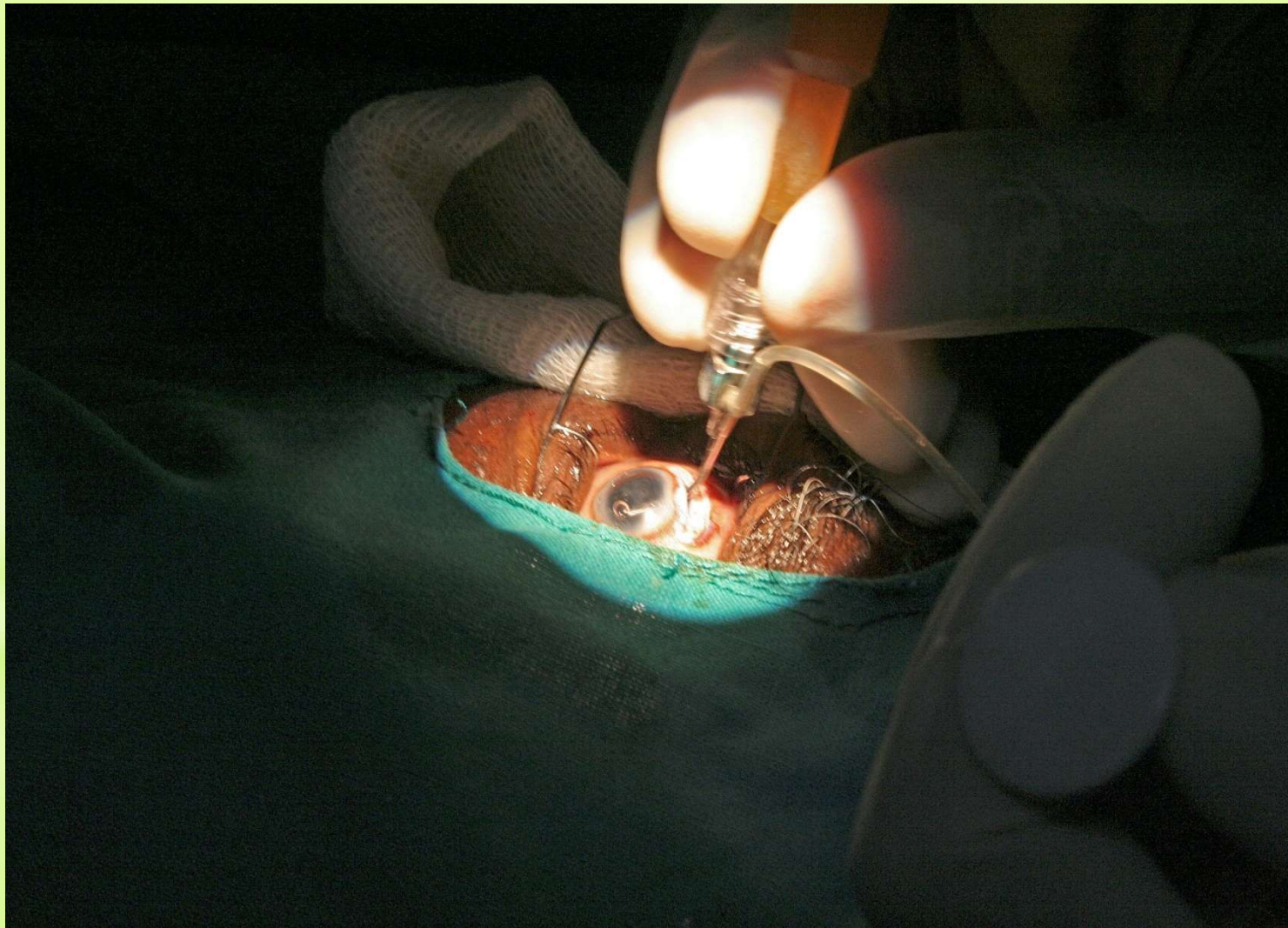
Sinskey IOL Dialer



Simcoe Irrigation/Aspiration Cannula



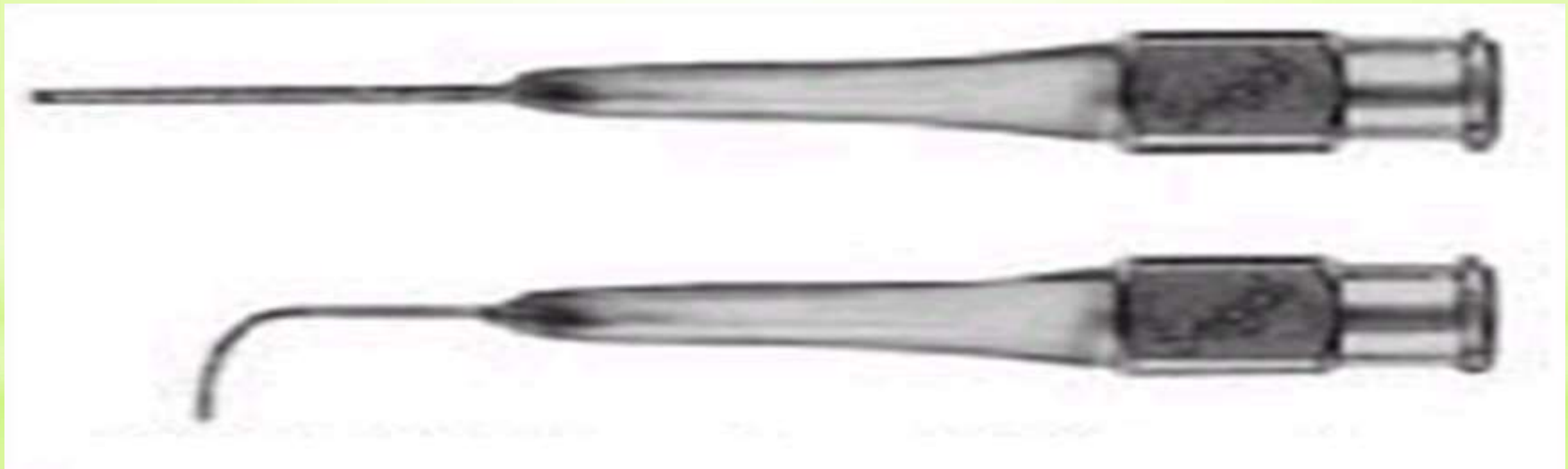
Simcoe Irrigation/Aspiration Cannula



Iris repositor



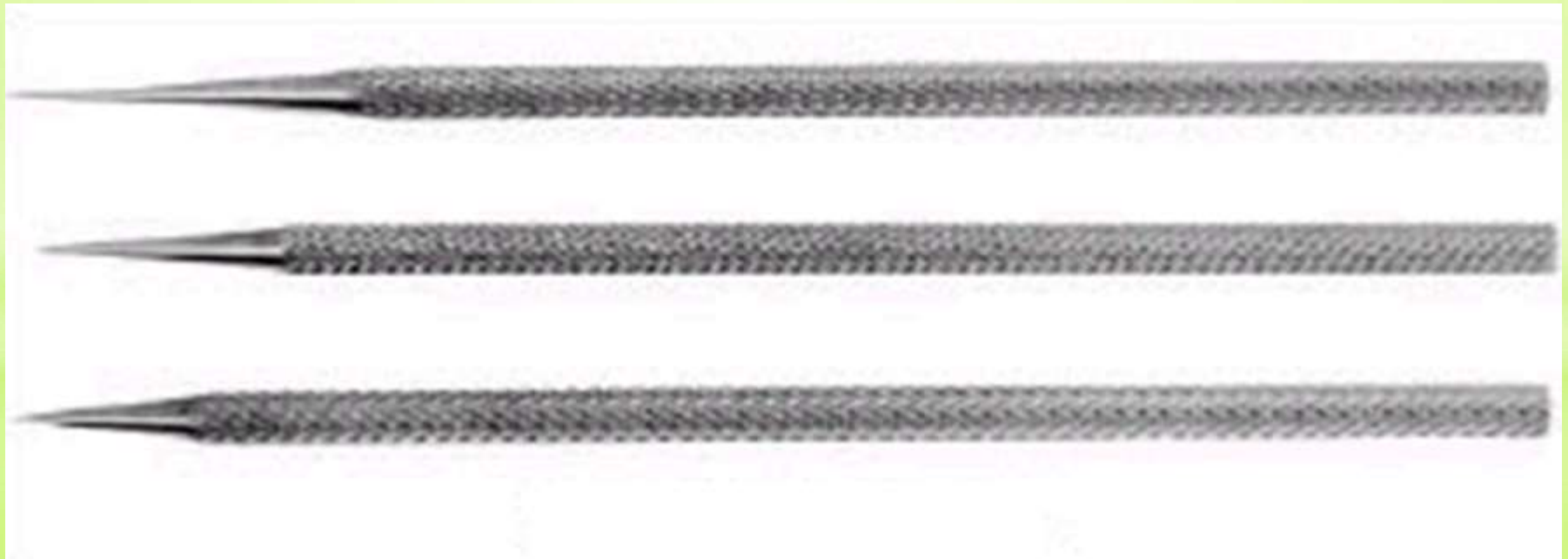
Lacrimal Cannula



Lacrimal Cannula



Lacrimal Dilators



Lacrimal Probes



SO-266 Bowman



DCR Punch



Blade Holder



SO-199 Bard Parker Handle

Artery Forceps



SO-262 Hartman

Clinic Instruments

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Slitlamp

SLIT LAMP
Biomicroscopy



Slitlamp



Trial Frame



Lens Trial Case



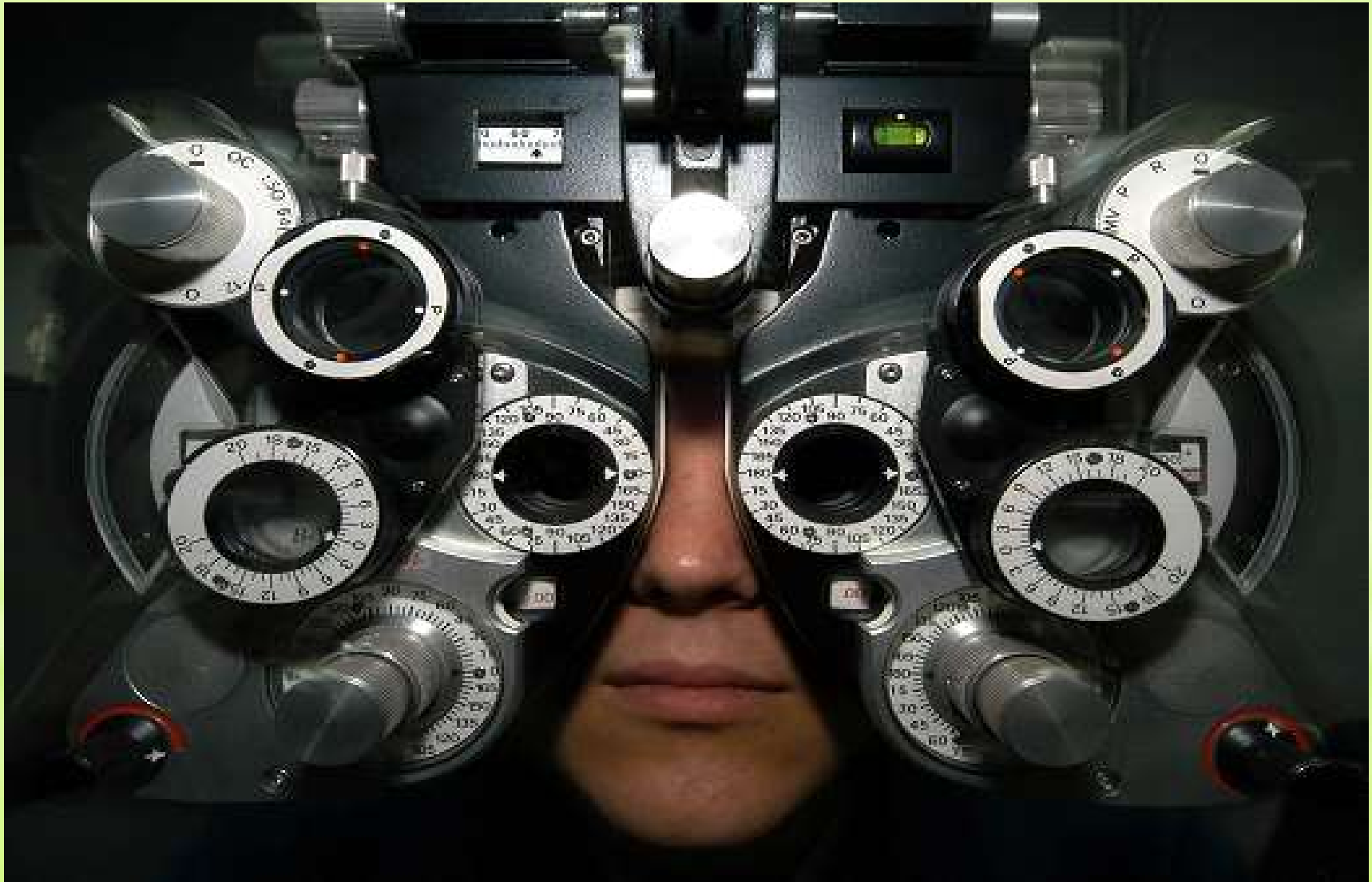
Trial Frame



Trial Lenses and Frame



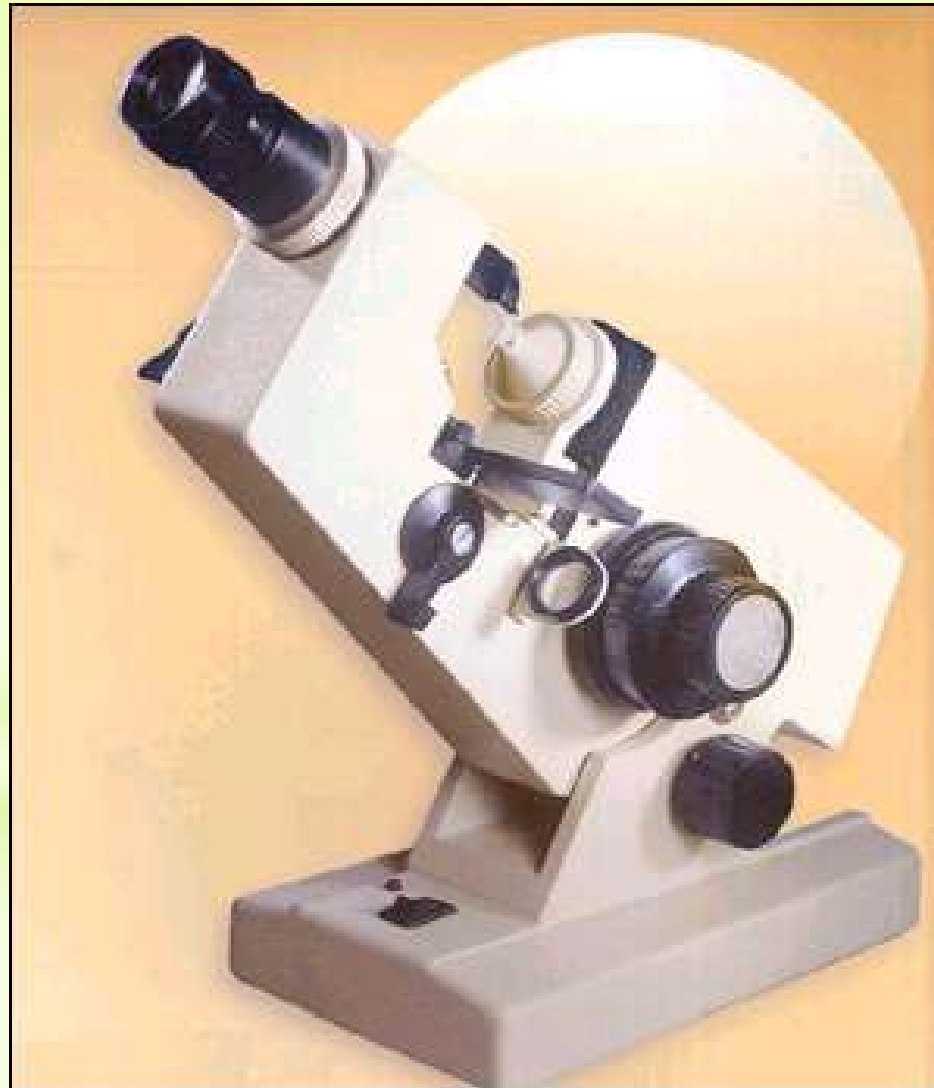
Phoropter



Phoropter



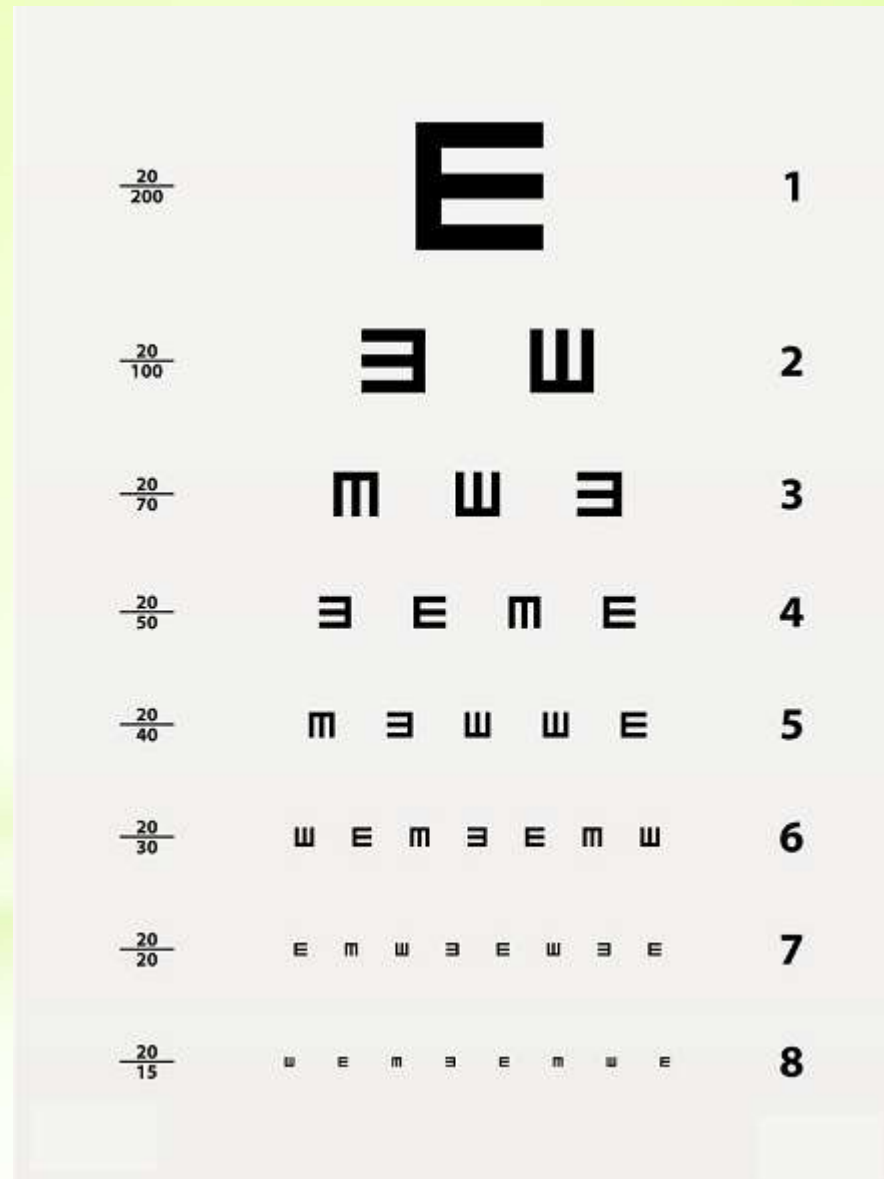
Lensemeter



Auto-Lensemeter



Snellen E chart

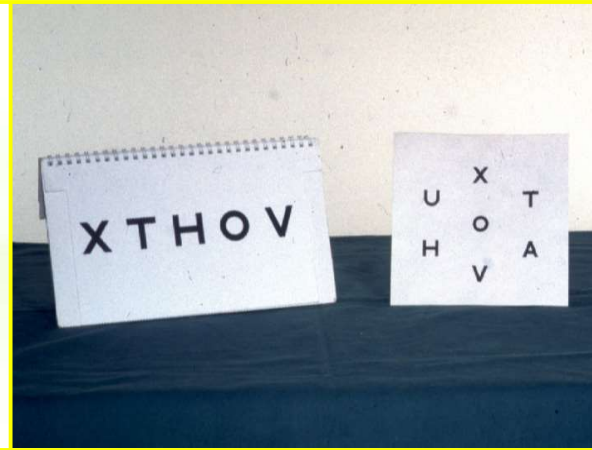


Visual acuity tests in verbal children

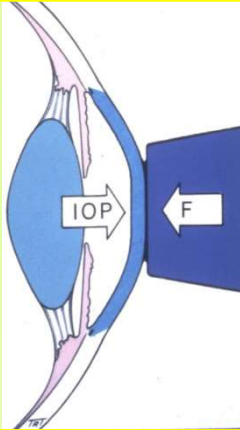
At age 2 years (naming pictures)



At age 3 years (matching tests)



Tonometers



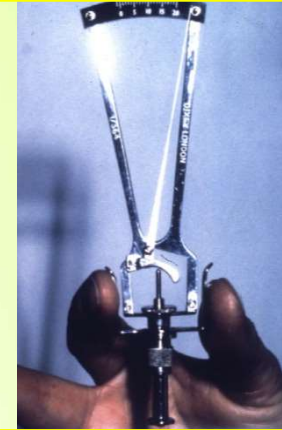
Goldmann

Contact applanation



Perkins

Portable contact applanation



Schiotz

Contact indentation



Air-puff

Non-contact indentation



Pulsair 2000 (Keeler)

Portable non-contact applanation



Tono-Pen

Portable contact applanation

Indirect Ophthalmoscopy

90 Diopter Lens



Indirect Ophthalmoscopy 20 Diopter Lens

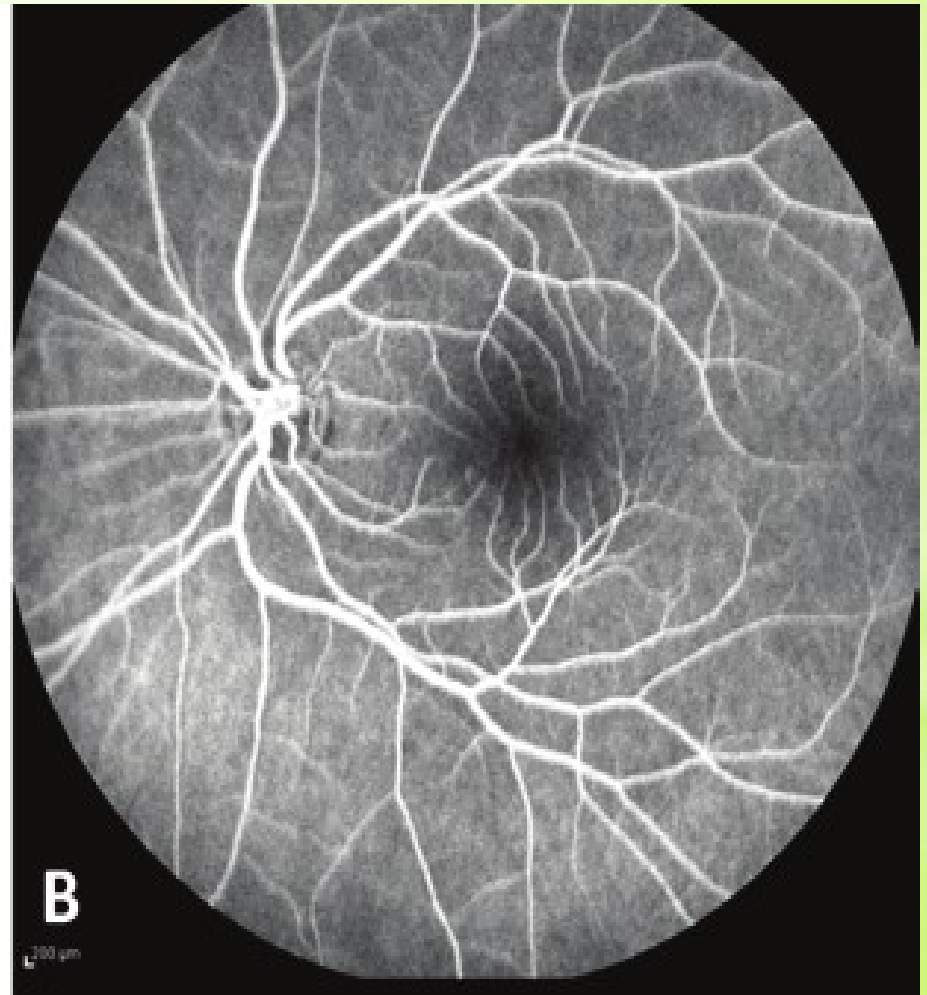
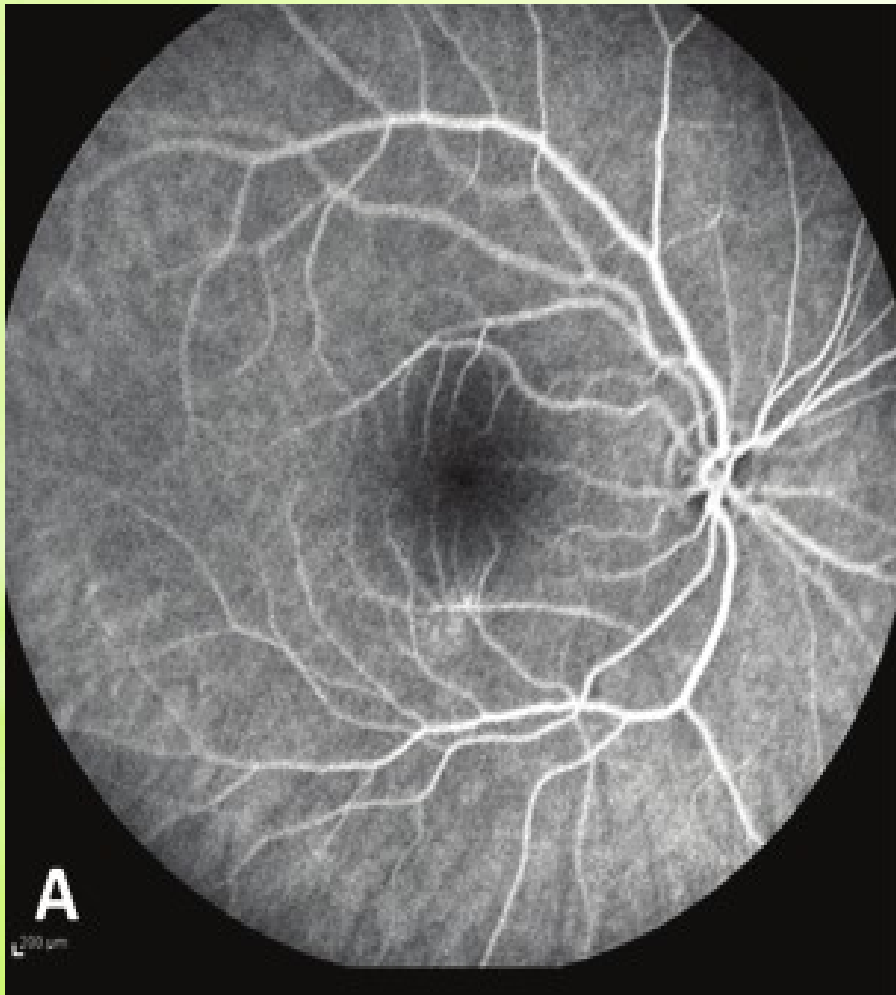


Fundus Photography & Flourescein Angiography

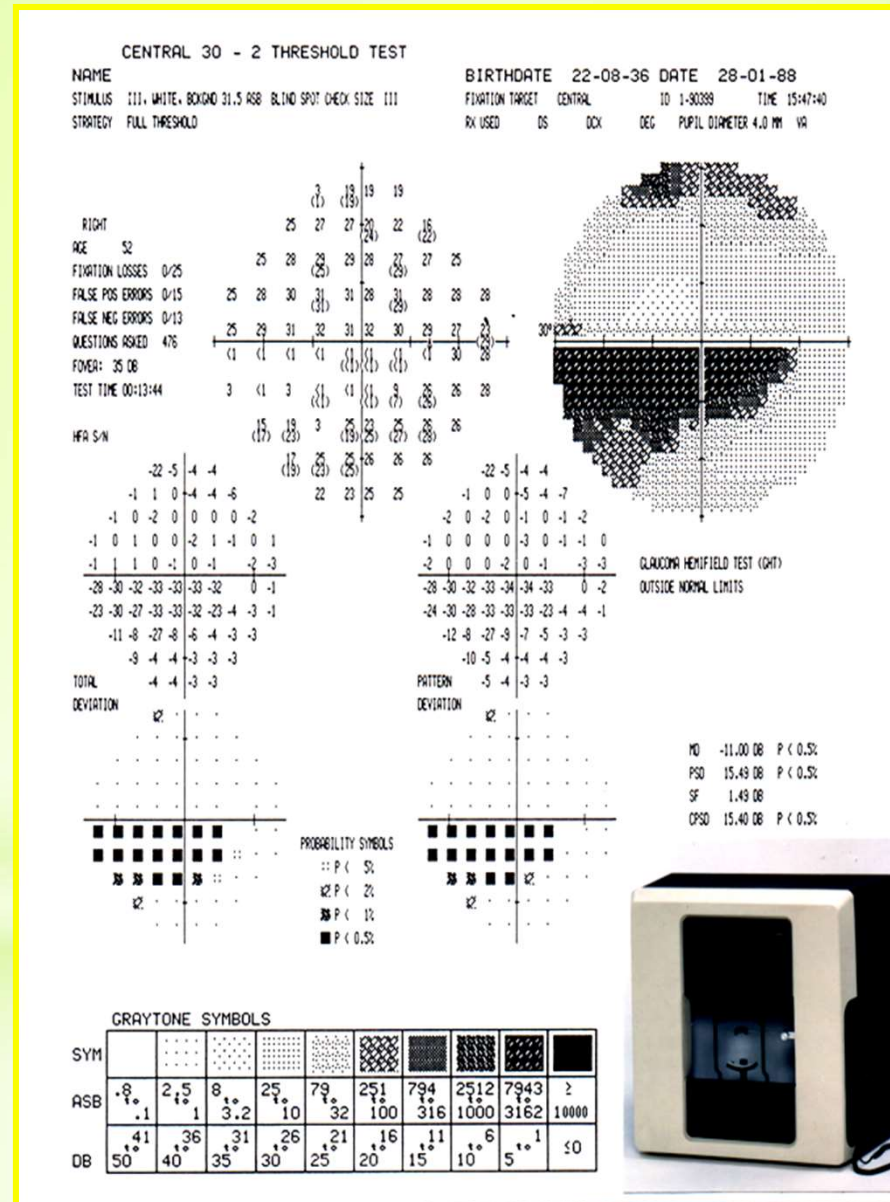


- 1. Take red-free photograph**
- 2. Inject rapidly 5 ml of 10% solution**
- 3. Take photographs at 1 sec intervals between 5-25 sec after injection**

Fundus Photography & Fluorescein Angiography



Visual Field Examination



Humphrey
Perimetry

Keratometer



Surgical Loop



BLINDNESS

- WHO definition of blindness

Visual acuity of less than 3/60 (Snellens) or its equivalent

- In the absence appropriate vision charts (By non-specialized personnel), the WHO has now added the “Inability to count fingers in daylight at a distance of 3 meters” to indicate less than 3/60 or its equivalent.

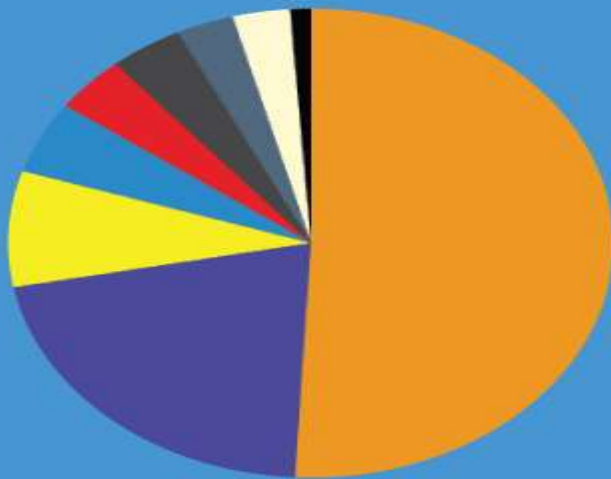
Causes of Blindness in Yemen

1. CATARACT
2. GLAUCOMA
3. DIABETIC RETINOPATHY
4. CORNEAL OPACITY
5. AGE RELATED MACULAR DEGENERATION

Causes of Blindness Worldwide



LEADING CAUSE OF BLINDNESS WORLDWIDE

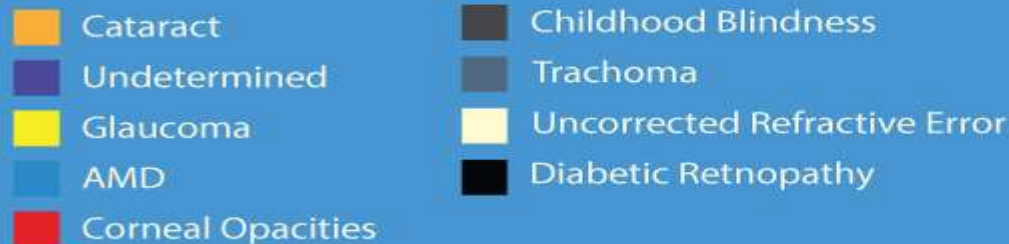


Cataracts are the
leading cause of
blindness, accounting for

51%

of total vision loss
throughout the world,
which represents nearly

**20 Million
People**



CRYSTALLINE LENS

Prof. Mahfouth A Bamashmus
FRCSEd, FRCOphth

CATARACT

1. Classification of age-related cataract

- Morphological
- According to maturity

2. Other causes of cataracts

- Diabetes
- Myotonic dystrophy
- Atopic dermatitis
- Trauma
- Drugs
- Secondary (complicated)

3. Surgery

- Large incision extracapsular extraction
- Phacoemulsification

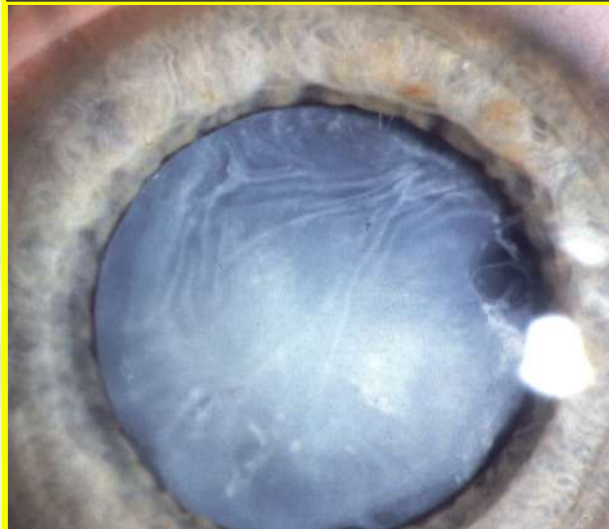
Classification according to maturity



Immature



Mature



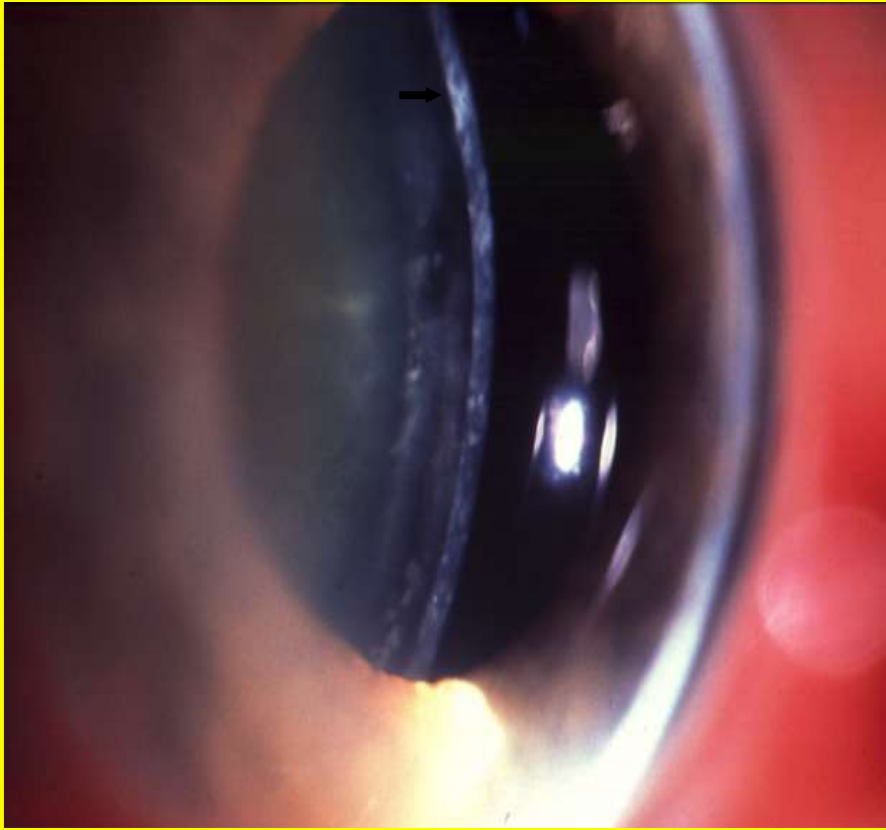
Hypermaturation



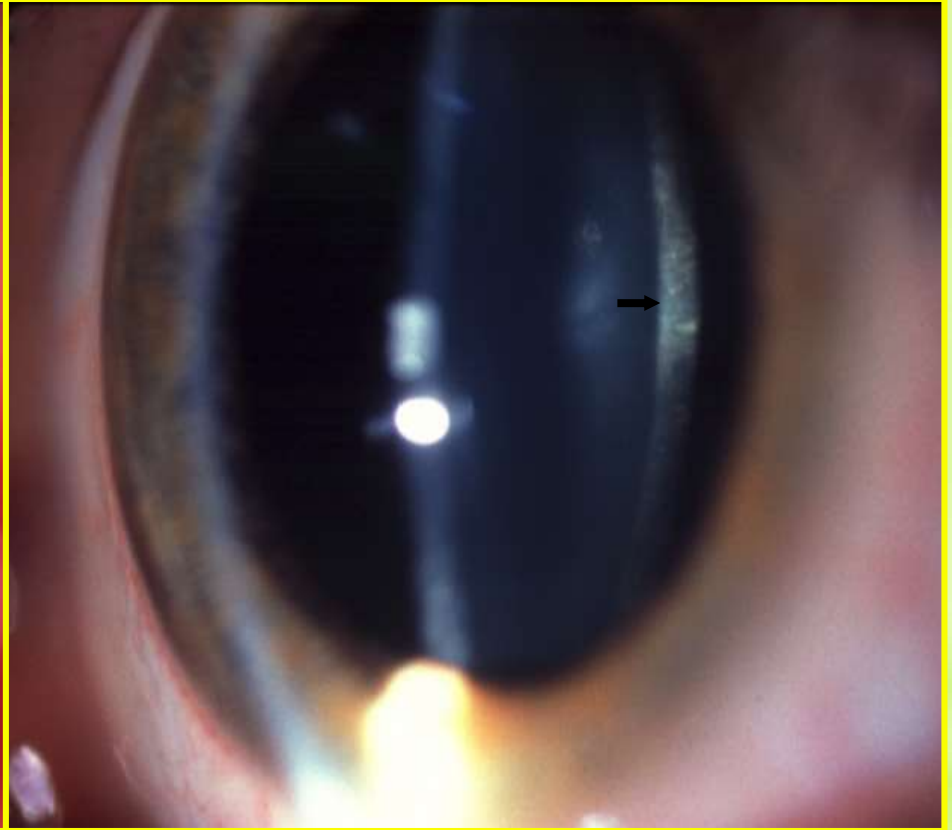
Morgagnian

Subcapsular cataract

Anterior

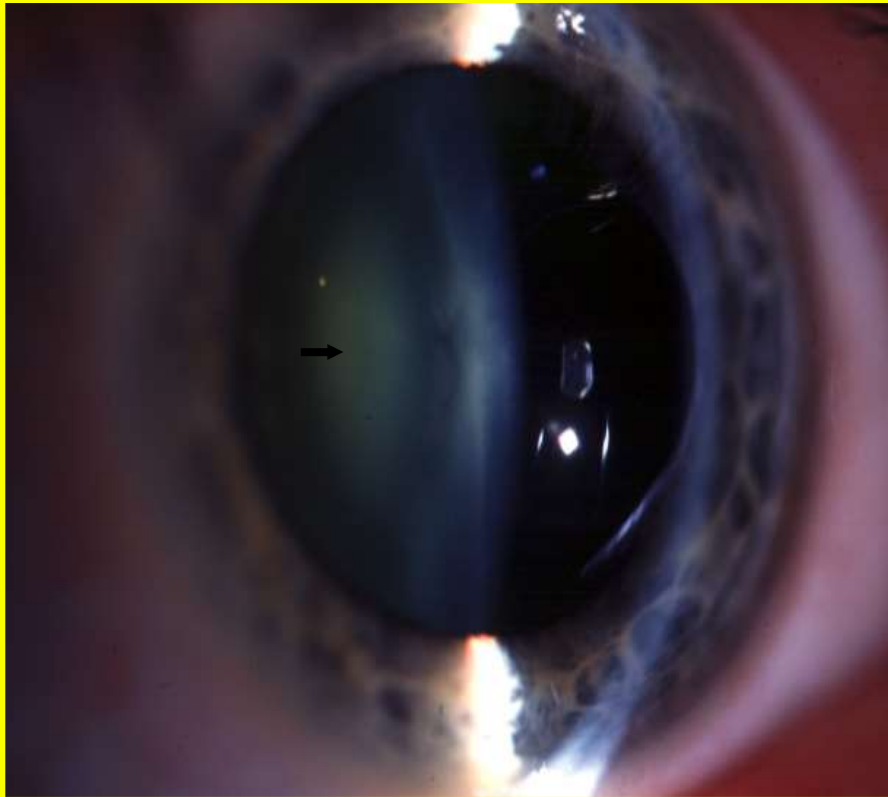


Posterior

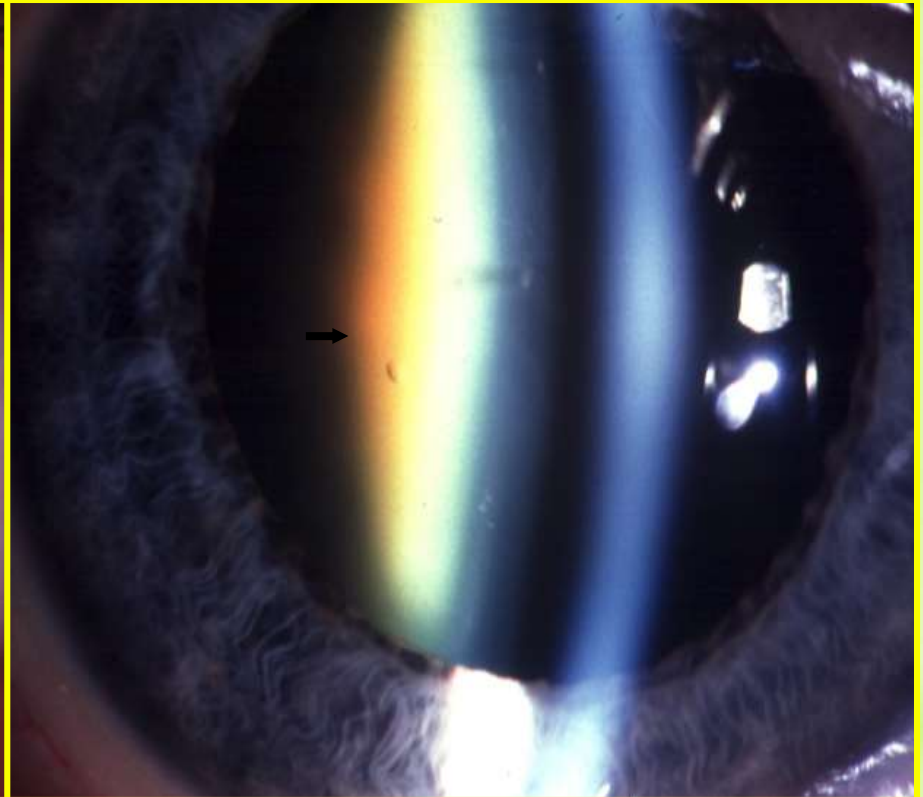


Nuclear cataract

Progression



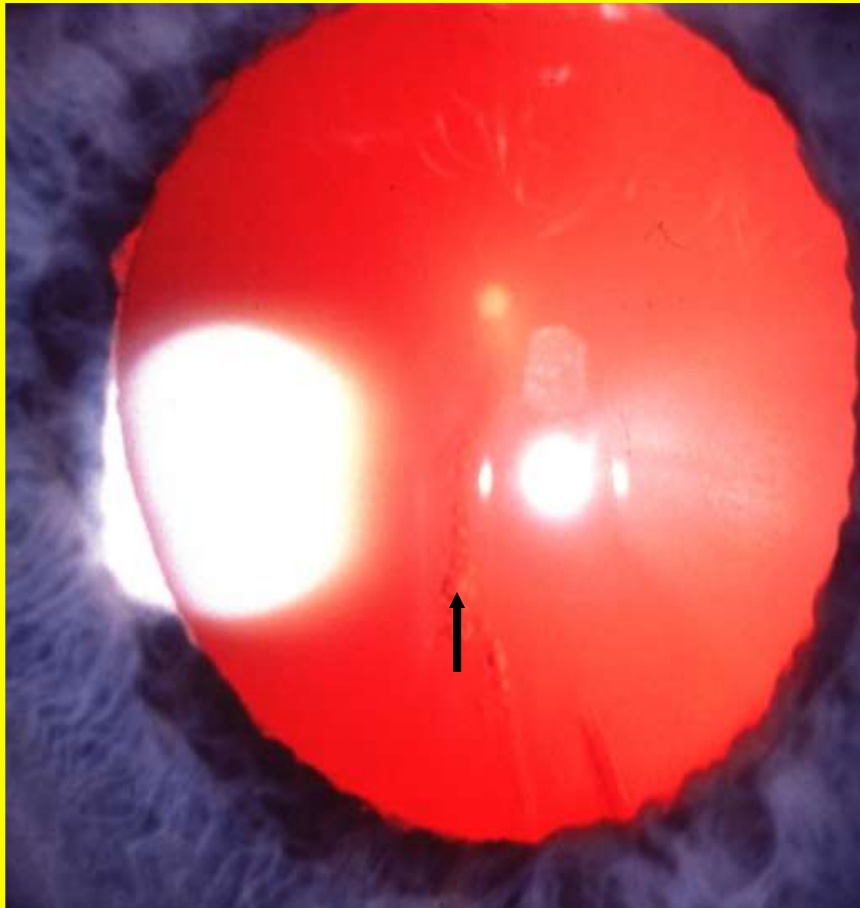
- Exaggeration of normal nuclear ageing change
- Causes increasing myopia



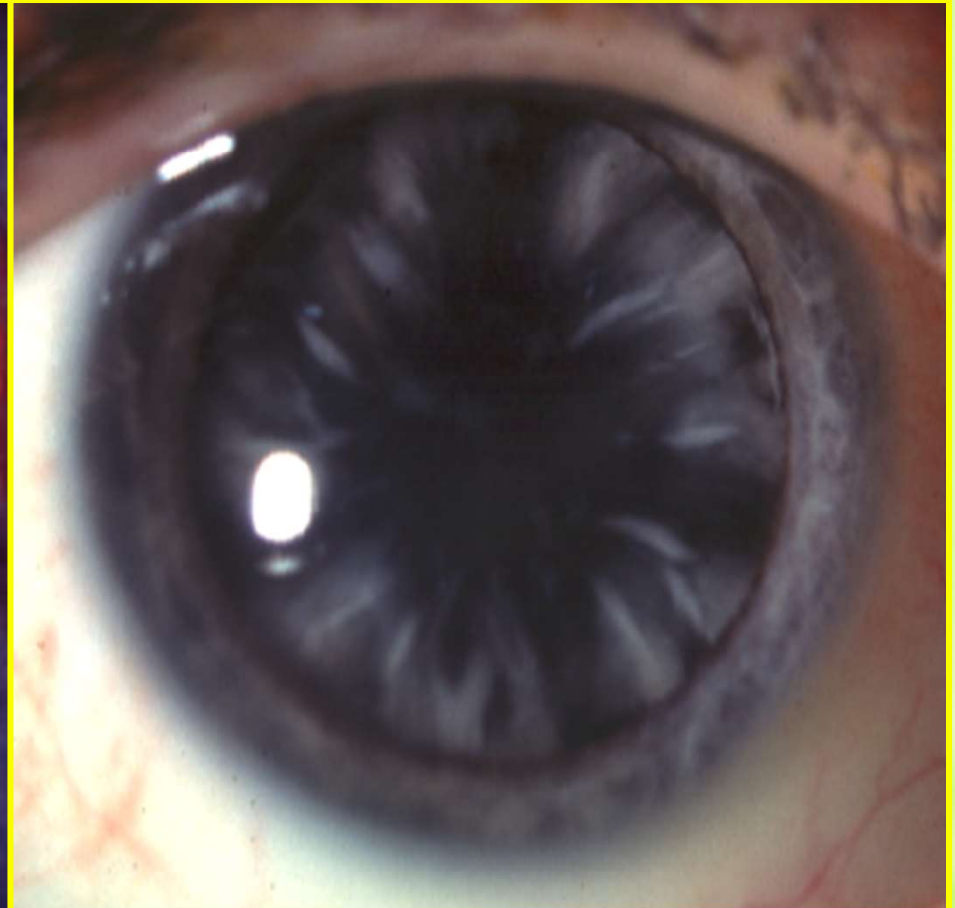
- Increasing nuclear opacification
- Initially yellow then brown

Cortical cataract

Progression

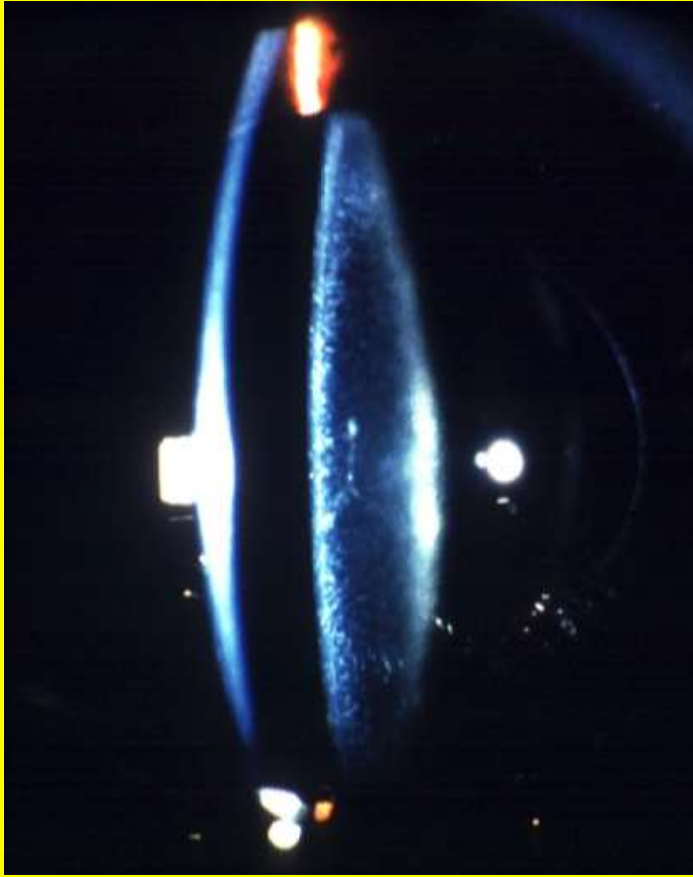


Initially vacuoles and clefts



Progressive radial spoke-like opacities

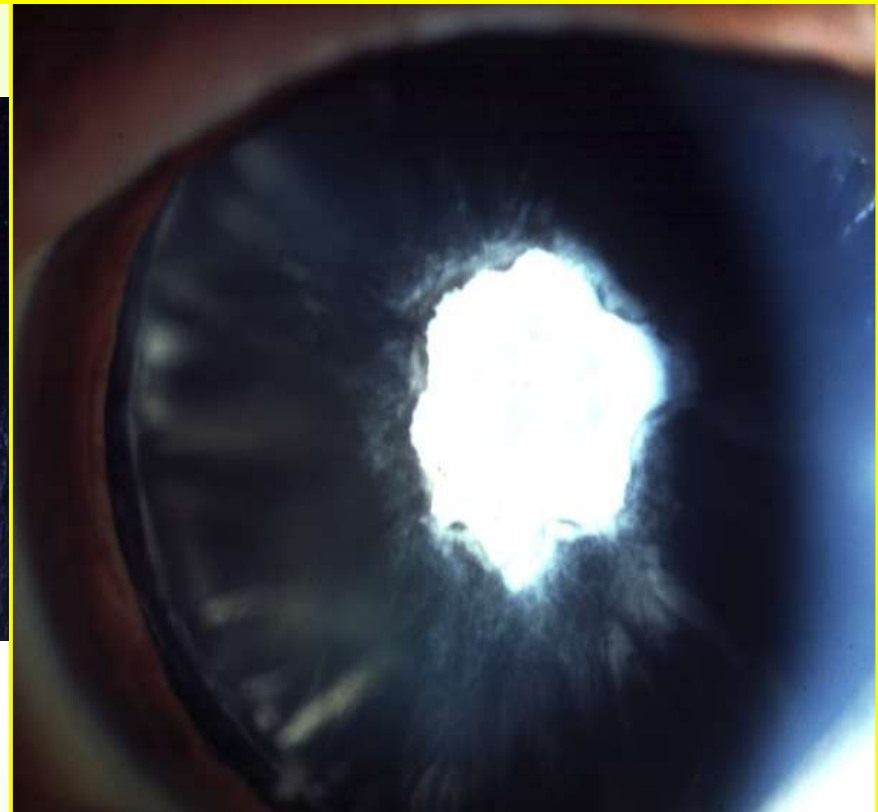
Other causes of cataract - diabetes

Juvenile	Adult
	
• White punctate or snowflake posterior or anterior opacities • May mature within few days	• Cortical and subcapsular opacities • May progress more quickly than in non-diabetics

Other causes of cataract - atopic dermatitis



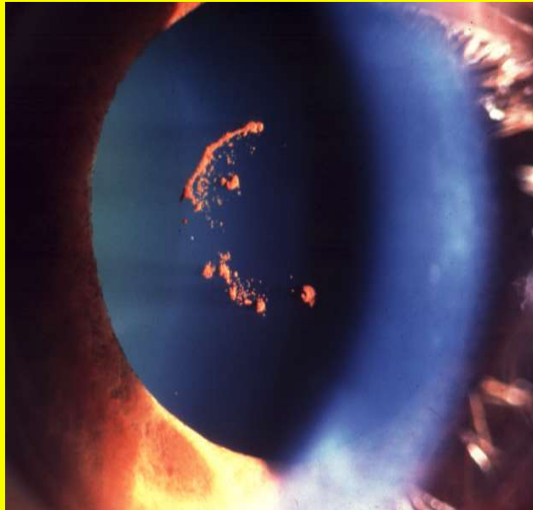
- Cataract develops in 10% of cases between 15-30 years
 - Bilateral in 70%
 - Frequently becomes mature



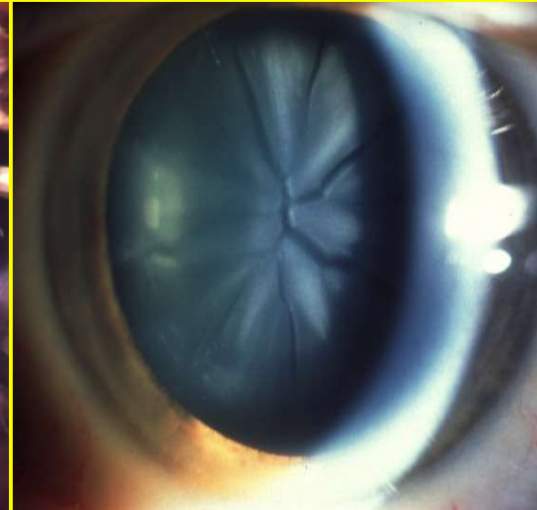
- Anterior subcapsular plaque (shield cataract)
- Wrinkles in anterior capsule

Causes of traumatic cataract

Concussion



'Vossius' ring from imprinting of iris pigment



Flower-shaped

Penetration



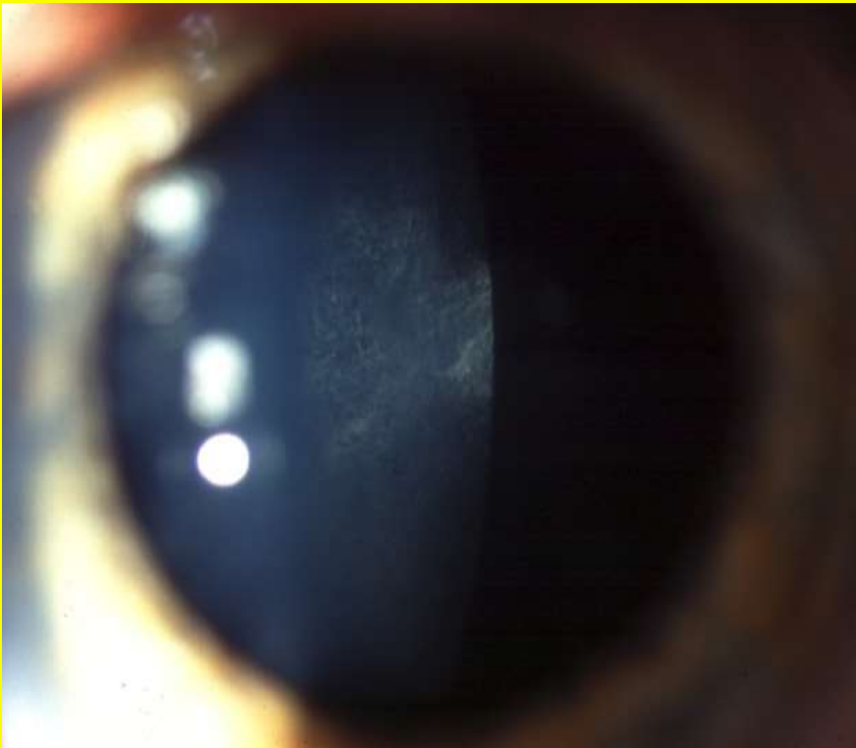
Other causes

- Ionizing radiation
- Electric shock
- Lightning

Drugs

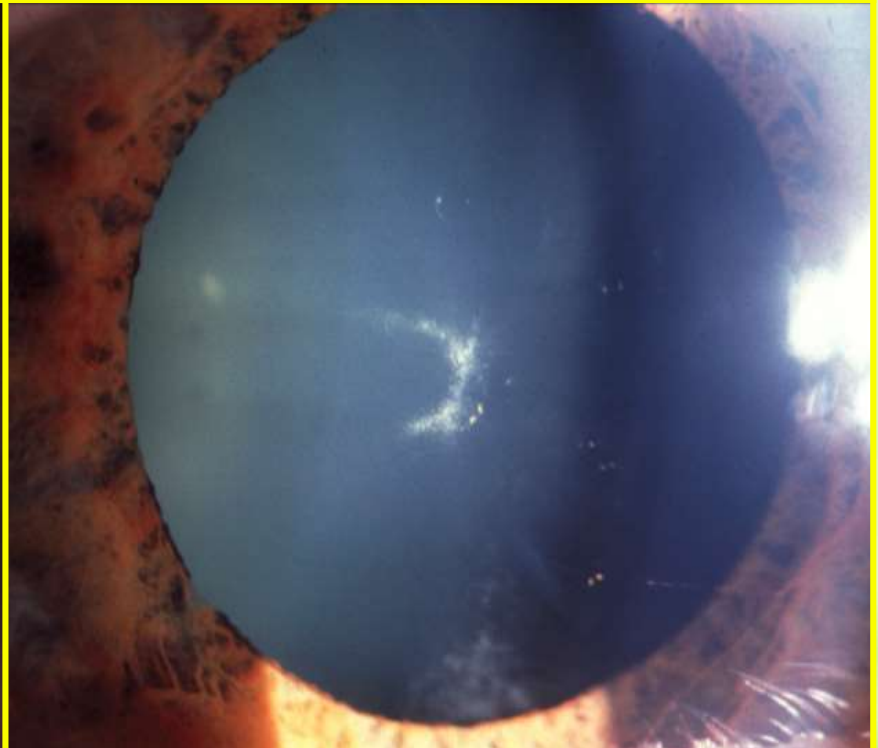
Systemic or topical steroids

- initially posterior subcapsular



Chlorpromazine

- central, anterior capsular granules



Other drugs

- Long-acting miotics
- Amiodarone
- Busulphan

Secondary (complicated) cataract

Posterior subcapsular



- Chronic anterior uveitis
- High myopia
- Hereditary fundus dystrophies

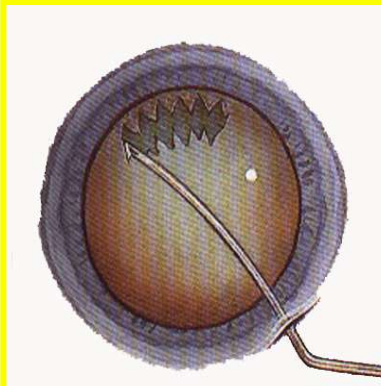
Glaukomflecken



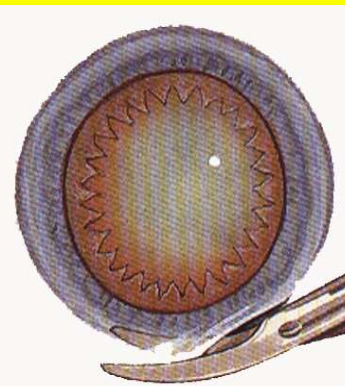
- Follows acute angle-closure glaucoma
- Central, anterior subcapsular opacities

Extracapsular cataract extraction

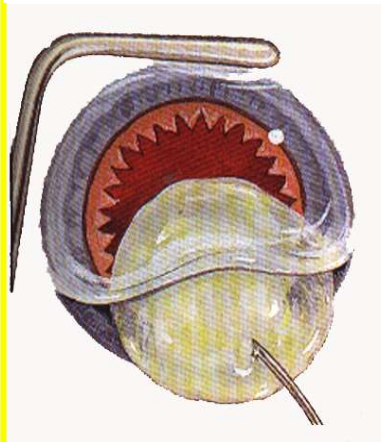
1. Anterior capsulotomy



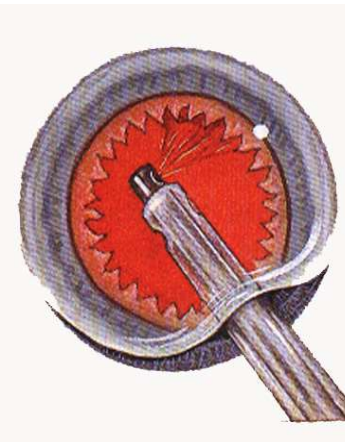
2. Completion of incision



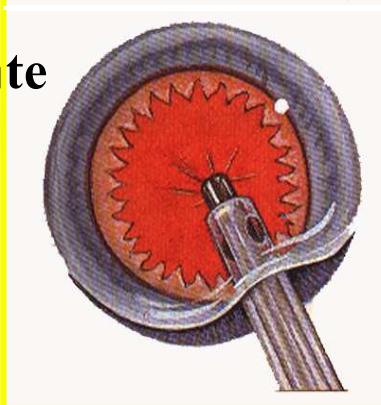
3. Expression of nucleus



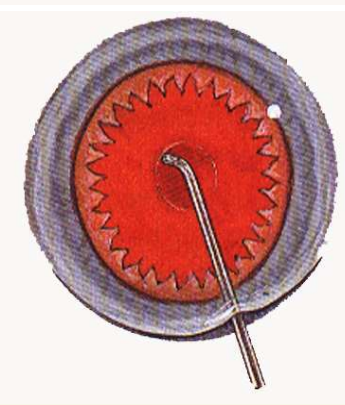
4. Cortical cleanup



5. Care not to aspirate posterior capsule accidentally

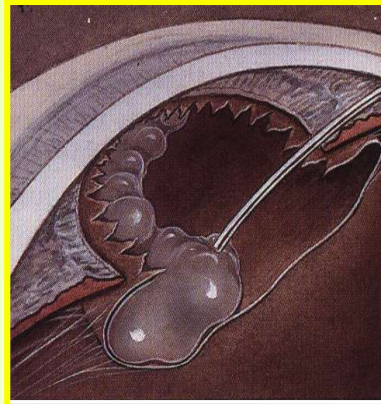


6. Polishing of posterior capsule, if appropriate

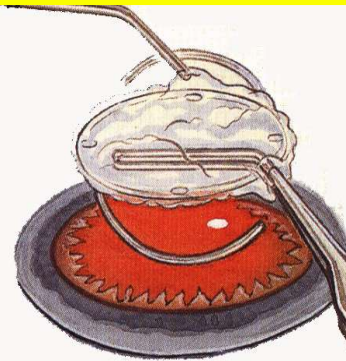


Extracapsular cataract extraction (cont.)

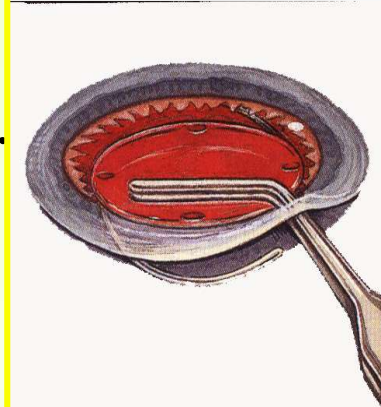
7. Injection of viscoelastic substance



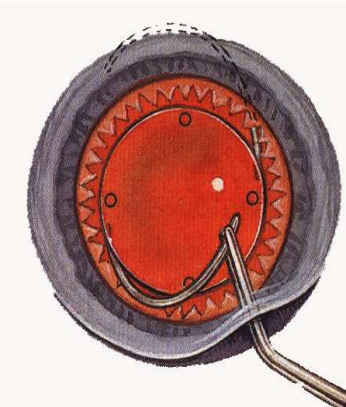
8. Grasping of IOL And coating with Viscoelastic substance



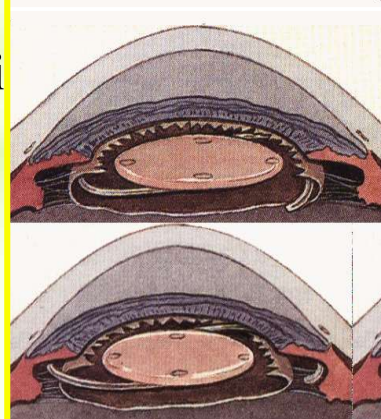
9. Insertion of inferior haptic and optic



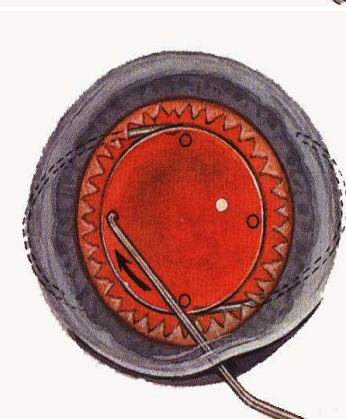
10. Insertion of superior haptic



11. Placement of haptic into capsular bag and not into Ciliary sulcus



12. Dialling of IOL into horizontal position



Phacoemulsification

1. Capsulorrhexis

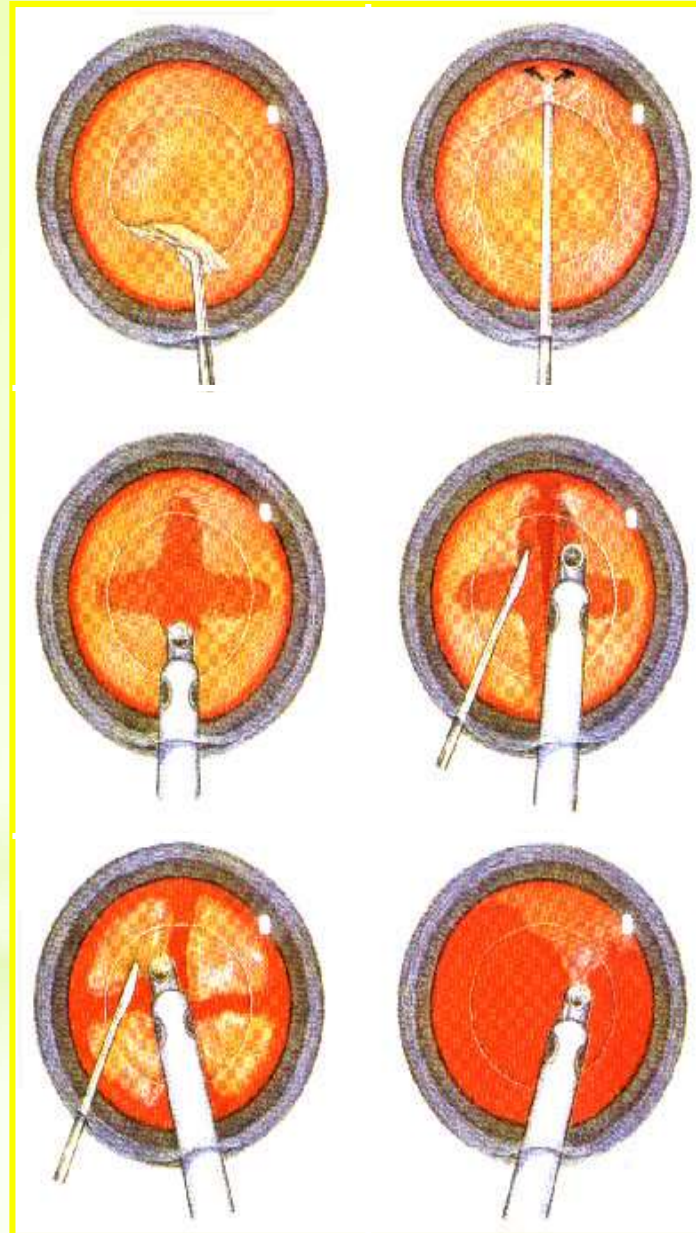
2. Hydrodissection

3. Sculpting of nucleus

4. Cracking of nucleus

5. Emulsification of each quadrant

6. Cortical cleanup and insertion of IOL

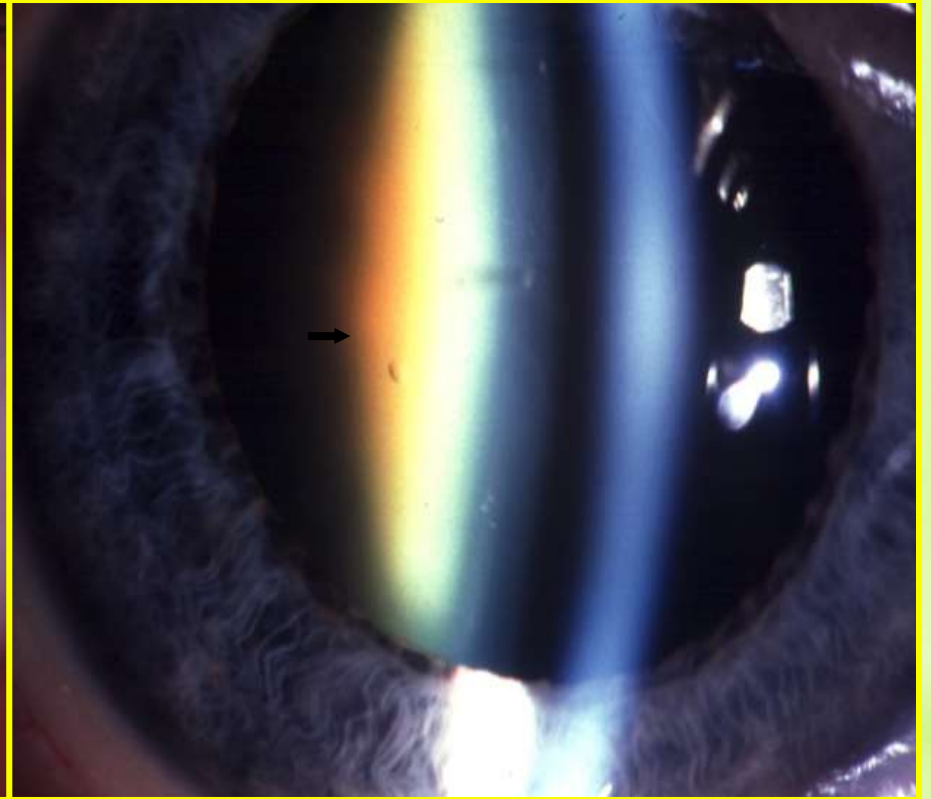
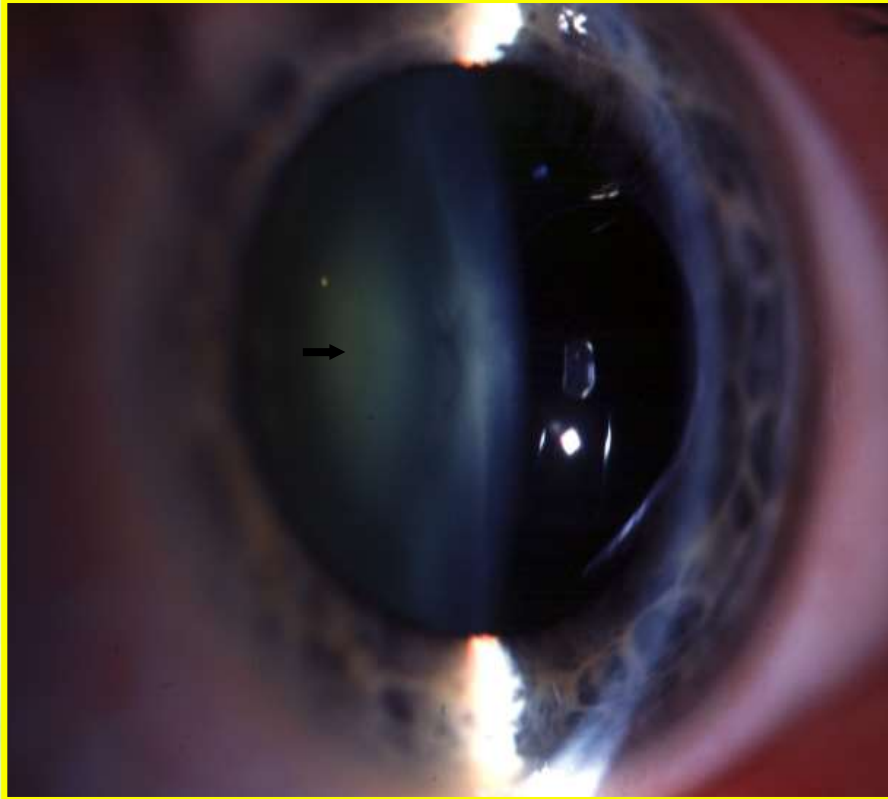


Congenital Cataract



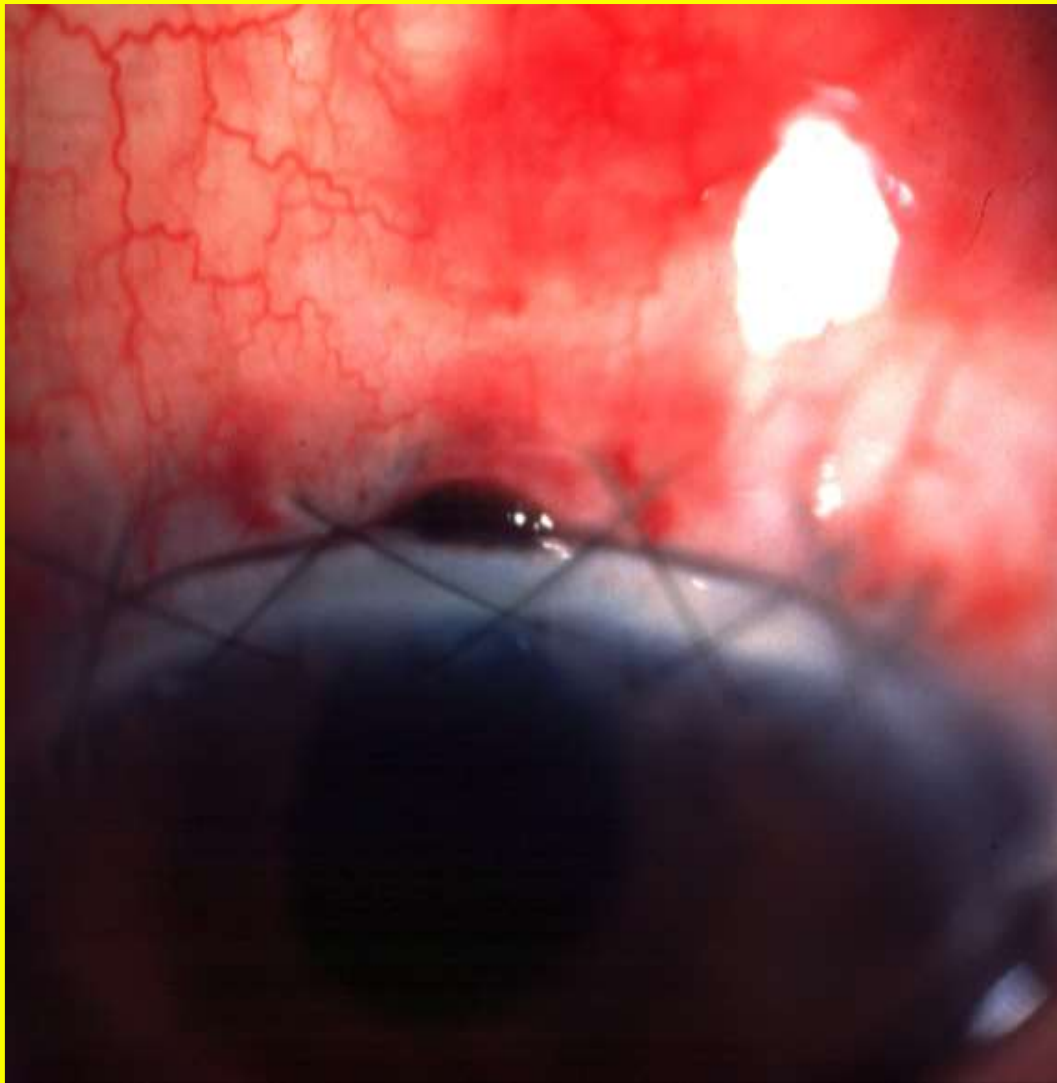
- **33% - idiopathic - may be unilateral or bilateral**
- **33% - inherited - usually bilateral**
- **33% - associated with systemic disease - usually bilateral**
- **Other ocular anomalies present in 50%**

Senile Cataract



Early postoperative complications

Iris prolapse



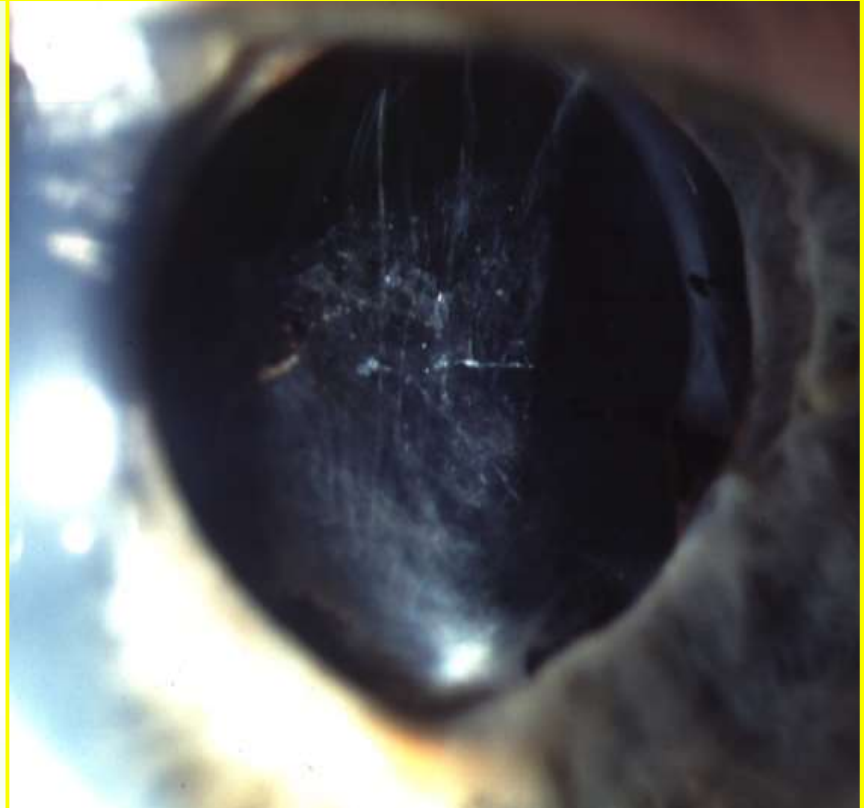
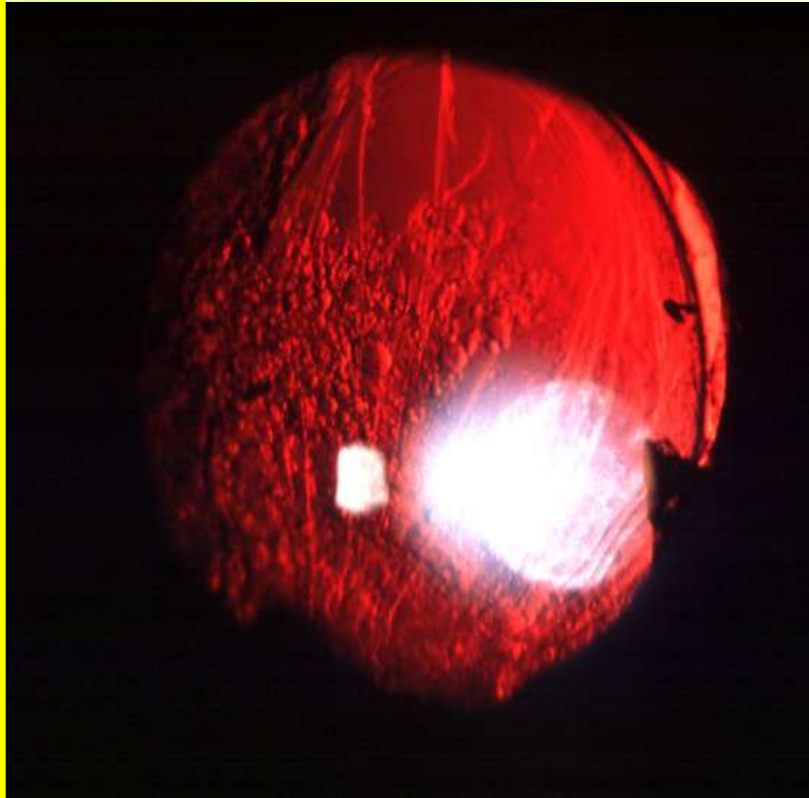
Cause

- Usually inadequate suturing of incision
- Most frequently follows inappropriate management of vitreous loss

Treatment

- Excise prolapsed iris tissue
- Resuture incision

Capsular Opacification



- Proliferation of lens epithelium
- Occurs after 3-5 years

Acute bacterial endophthalmitis

Incidence - about 1:1,000



Common causative organisms

- *Staph. epidermidis*
- *Staph. aureus*
- *Pseudomonas* sp.

Source of infection

- Patient's own external bacterial flora is most frequent culprit
- Contaminated solutions and instruments
- Environmental flora including that of surgeon and operating room personnel

ECTOPIA LENTIS

1. Acquired

2. Isolated familial ectopia lentis

3. Associated with systemic syndromes

- Marfan syndrome
- Weill-Marchesani syndrome
- Homocystinuria

4. Treatment options

Subluxated Lens (Ectopia Lentis)



GLAUCOMA

Prof. Mahfouth A Bamashmus
FRCSEd, FRCOphth

Primary Open Angle Glaucoma



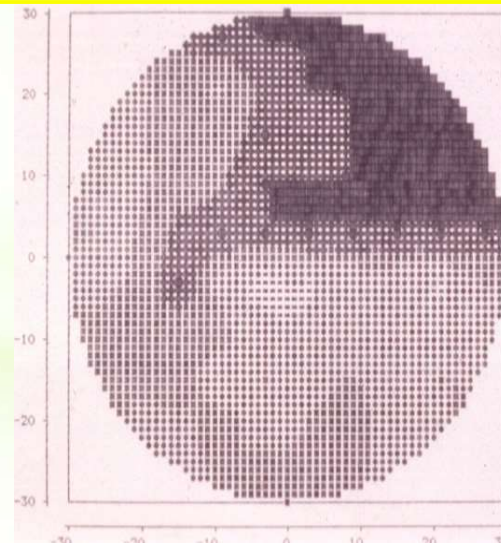
IOP > 21 mmHg



Open angle of normal appearance

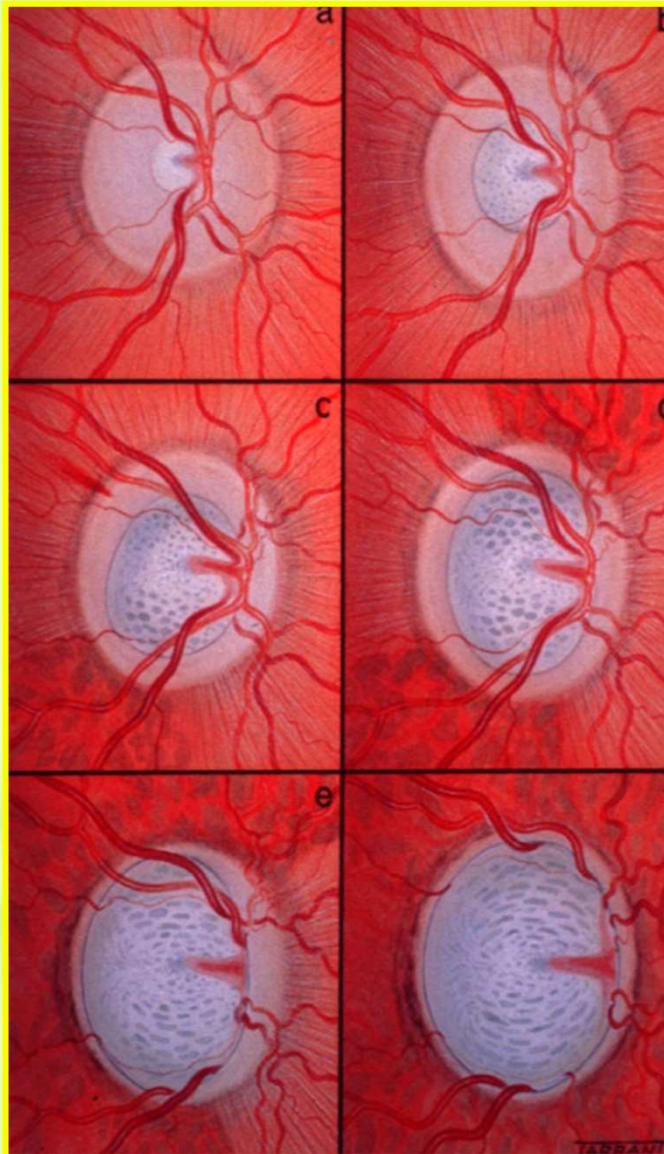


Glaucomatous disc damage



Visual field loss

Progression of glaucomatous cupping



a. Normal (c:d ratio 0.2)

**b. Concentric enlargement
(c:d ratio 0.5)**

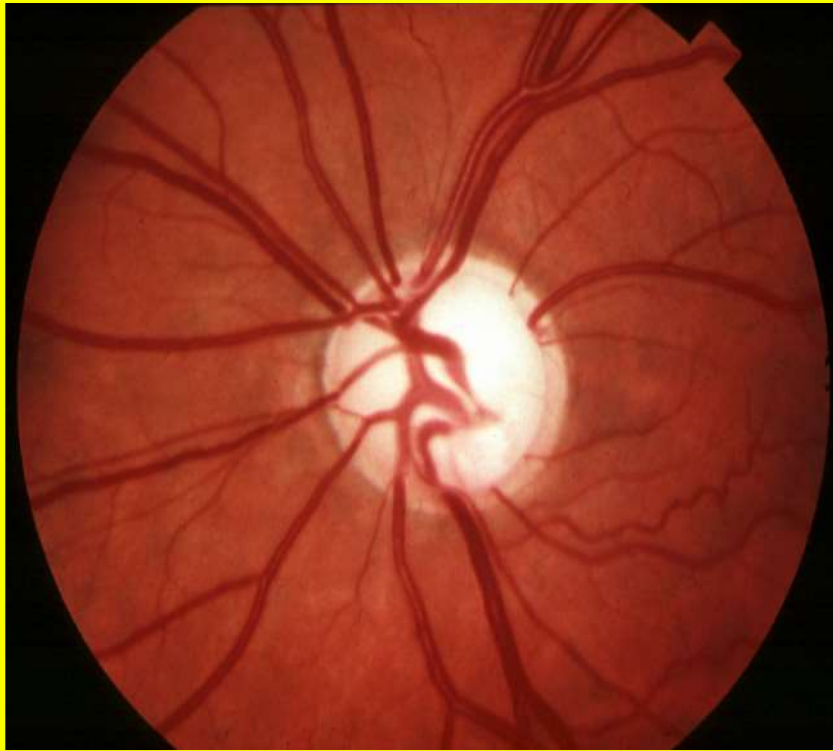
**c. Inferior expansion with
retinal nerve fibre loss**

**d. Superior expansion with
retinal nerve fibre loss**

**e. Advanced cupping with nasal
displacement of vessels**

**f. Total cupping with loss of
all retinal nerve fibres**

End-stage damage



- All neural disc tissue is destroyed
- Disc is white and deeply excavated



- Atrophy of all retinal nerve fibres
- Striations are absent
- Blood vessels appear dark and sharply defined

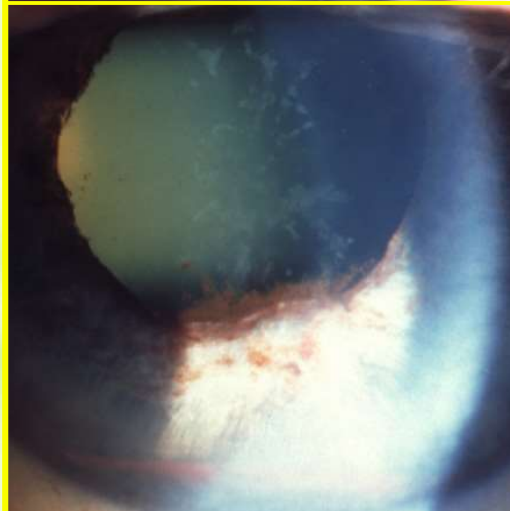
Signs of postcongestive angle-closure glaucoma



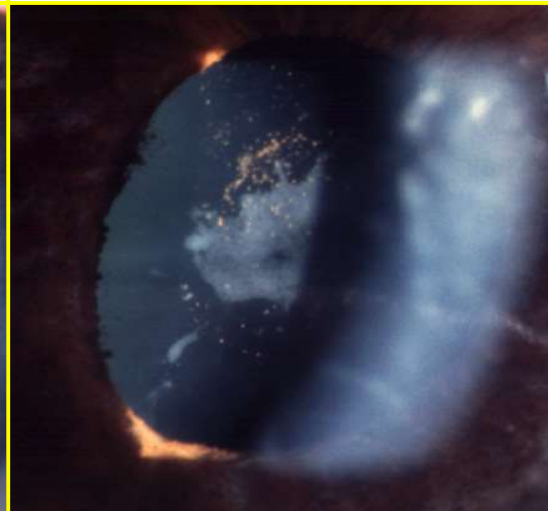
- Folds in Descemet membrane



- Stromal iris atrophy with spiral-like configuration



- Posterior synechiae
- Fine pigment on iris



- Fixed dilated pupil
- Glaukomflecken

Clinical features of primary congenital glaucoma

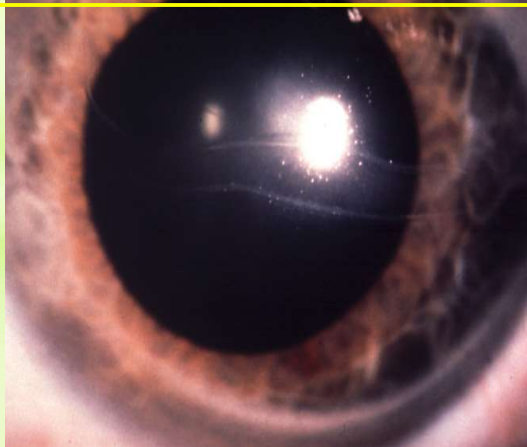
- Depend on age of onset
- Bilateral in 75% but frequently asymmetrical



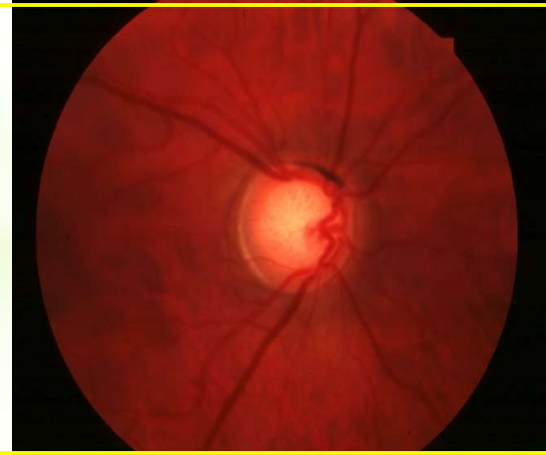
**Corneal oedema associated with
lacrimation and photophobia**



**Buphthalmos if IOP becomes
elevated prior to age 3 years.**

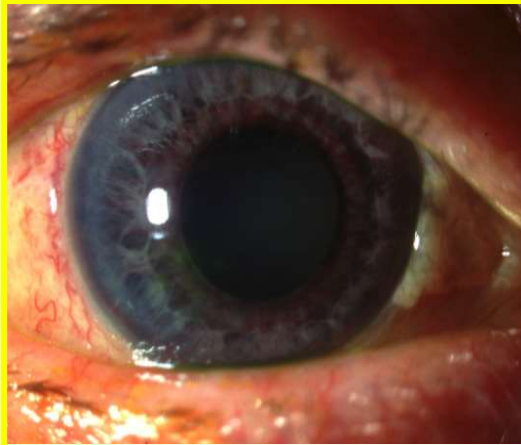


Breaks in Descemet membrane



Optic disc cupping

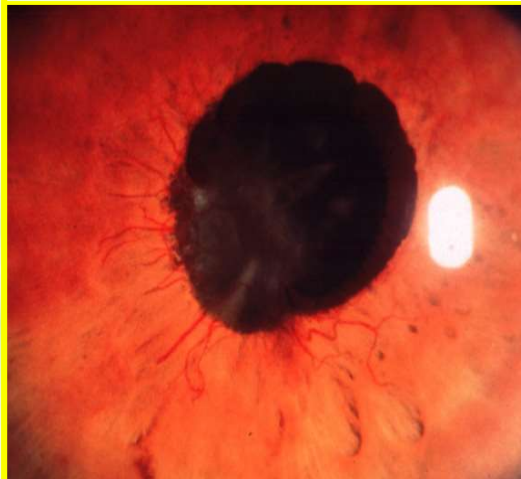
Neovascular Glaucoma (Rubeosis Iridis)



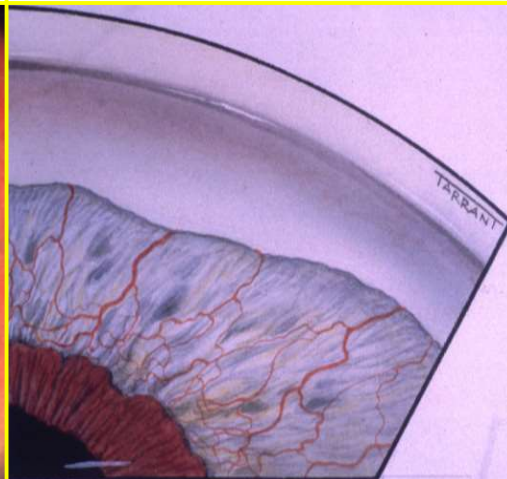
Severely reduced visual acuity, congestion and pain



Severe rubeosis iridis



Distortion of pupil and ectropion uveae



Synechial angle closure

RETINA

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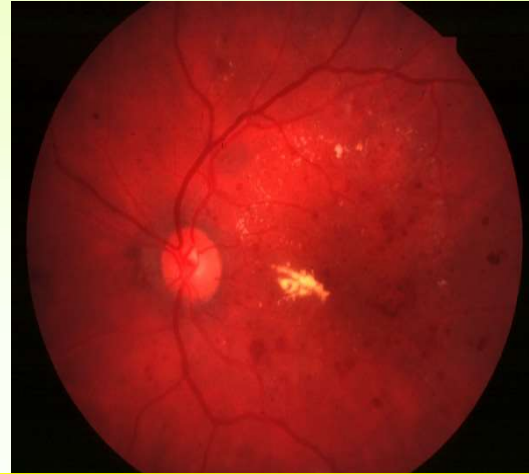
DIABETIC RETINOPATHY

1. Background diabetic retinopathy
2. Pre-proliferative diabetic retinopathy
3. Proliferative diabetic retinopathy
4. Diabetic Maculopathies
 - Focal
 - Diffuse
 - Ischaemic

Background diabetic retinopathy



Microaneurysms usually temporal to fovea



Intraretinal dot and blot haemorrhages



Hard exudates frequently arranged in clumps or rings



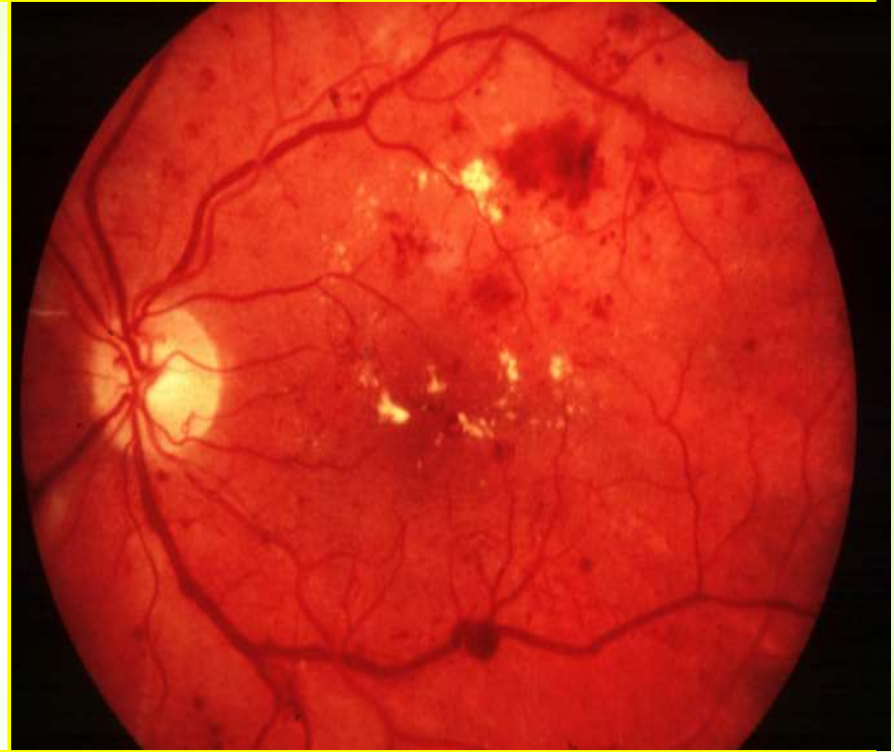
Retinal oedema seen as thickening on biomicroscopy

Preproliferative diabetic retinopathy

Signs



- Cotton-wool spots
- Venous irregularities



- Dark blot haemorrhages
- Intraretinal microvascular abnormalities (IRMA)

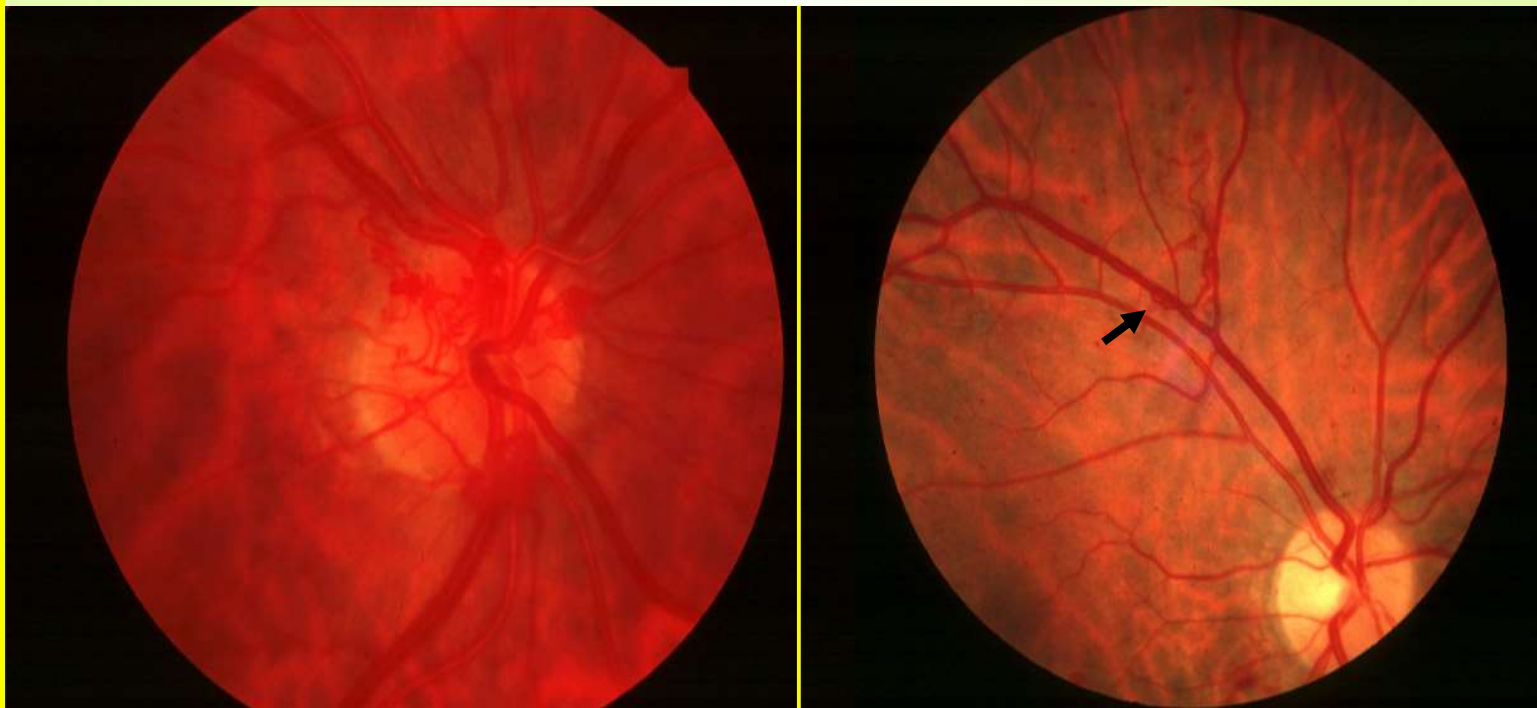
Treatment - not required but watch for proliferative disease

Proliferative diabetic retinopathy

- Affects 5-10% of diabetics
- IDD at increased risk (60% after 30 years)

Neovascularization

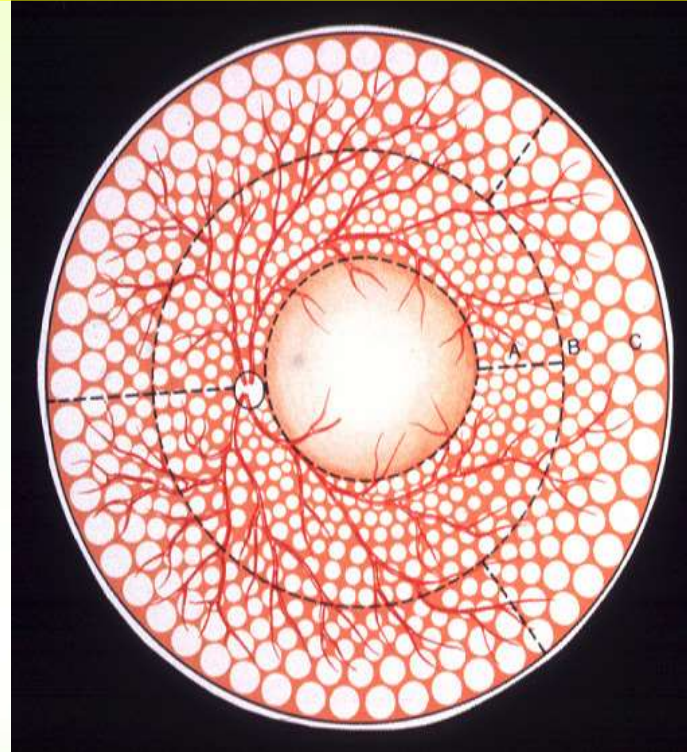
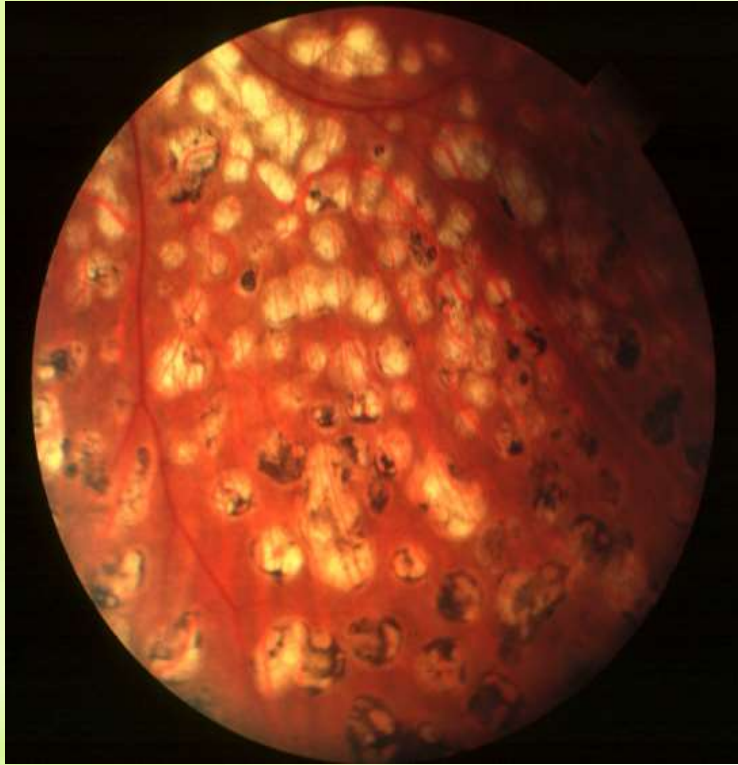
- Flat or elevated



Neovascularization of disc = NVD

Neovascularization elsewhere = NVE

Laser panretinal photocoagulation



- **Area covered by complete PRP**
- **Follow-up 4 to 8 weeks**

Branch retinal vein occlusion (BRVO)

Signs of acute BRVO



- Venous tortuosity and dilatation
- Flame-shaped and 'dot-blot' haemorrhages
- Cotton-wool spots and retinal oedema

Prognosis - VA 6/12 or better after 6 months in 50%

Complications - chronic macular oedema and neovascularization

Central retinal vein occlusion (CRVO)

Signs of CRVO



- **Venous tortuosity and dilatation**
- **Retinal haemorrhages**
- **Cotton-wool spots**
- **Disc oedema**
- **Chronic macular oedema**

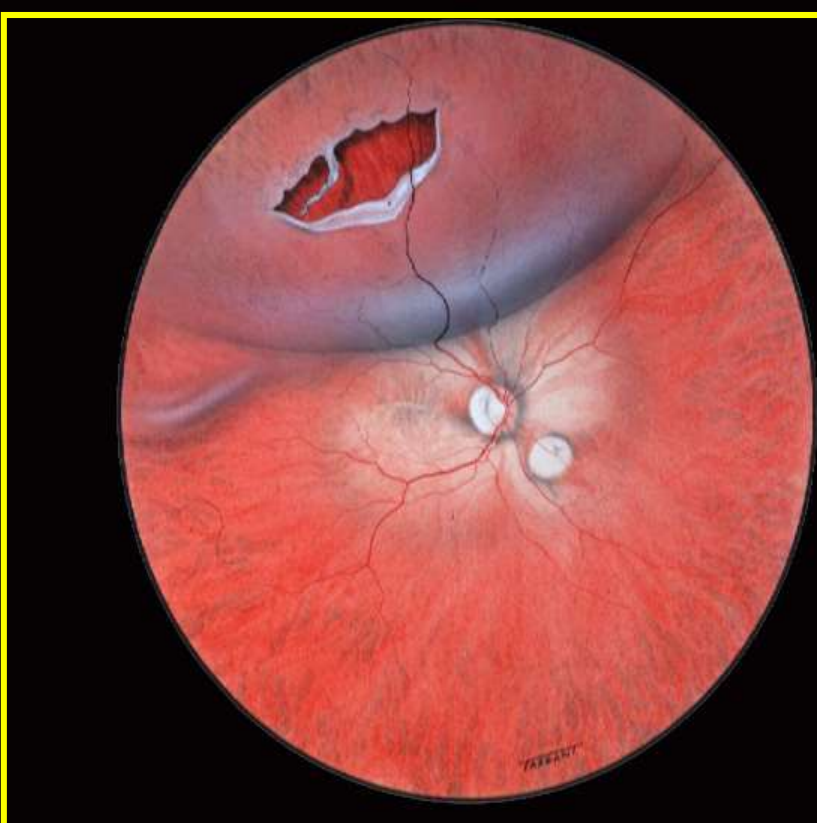
Central retinal artery occlusion (CRAO)



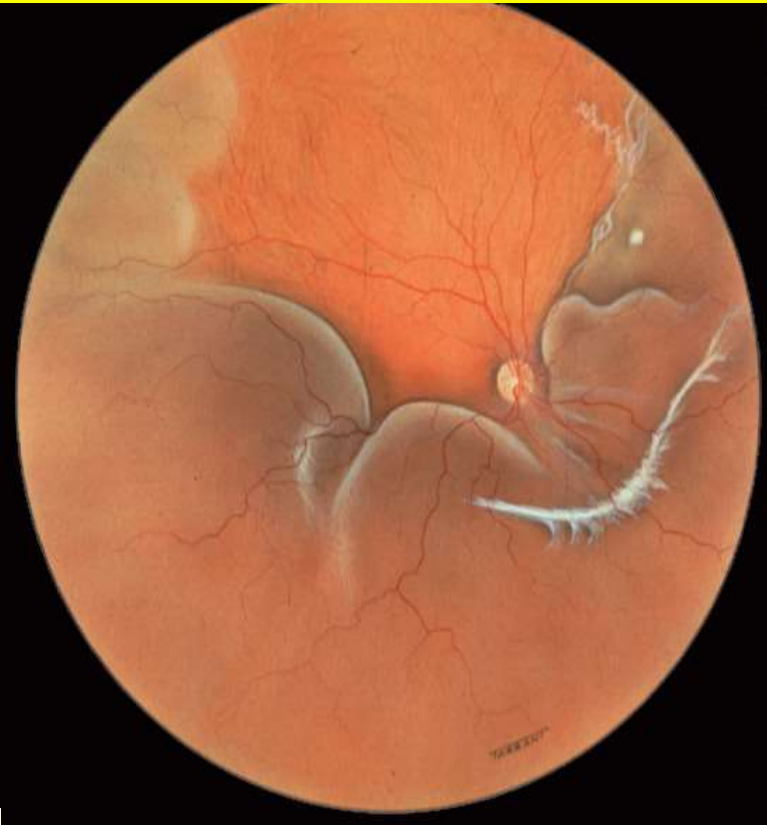
- **Retinal whitening**
- **‘Cherry-red spot’ at macula**
- **Arteriolar and venular narrowing**
- **Sludging and segmentation of blood column (cattle-trucking)**
- **Very poor prognosis**

Retinal detachment (RD)

Separation of sensory retina from RPE by subretinal fluid (SRF)



Rhegmatogenous - caused by
a retinal break



Non-rhegmatogenous - tractional
or exudative

Fresh Rhegmatogenous RD - signs

- Annual incidence - 1:10,000 of population
- Eventually bilateral in 10%

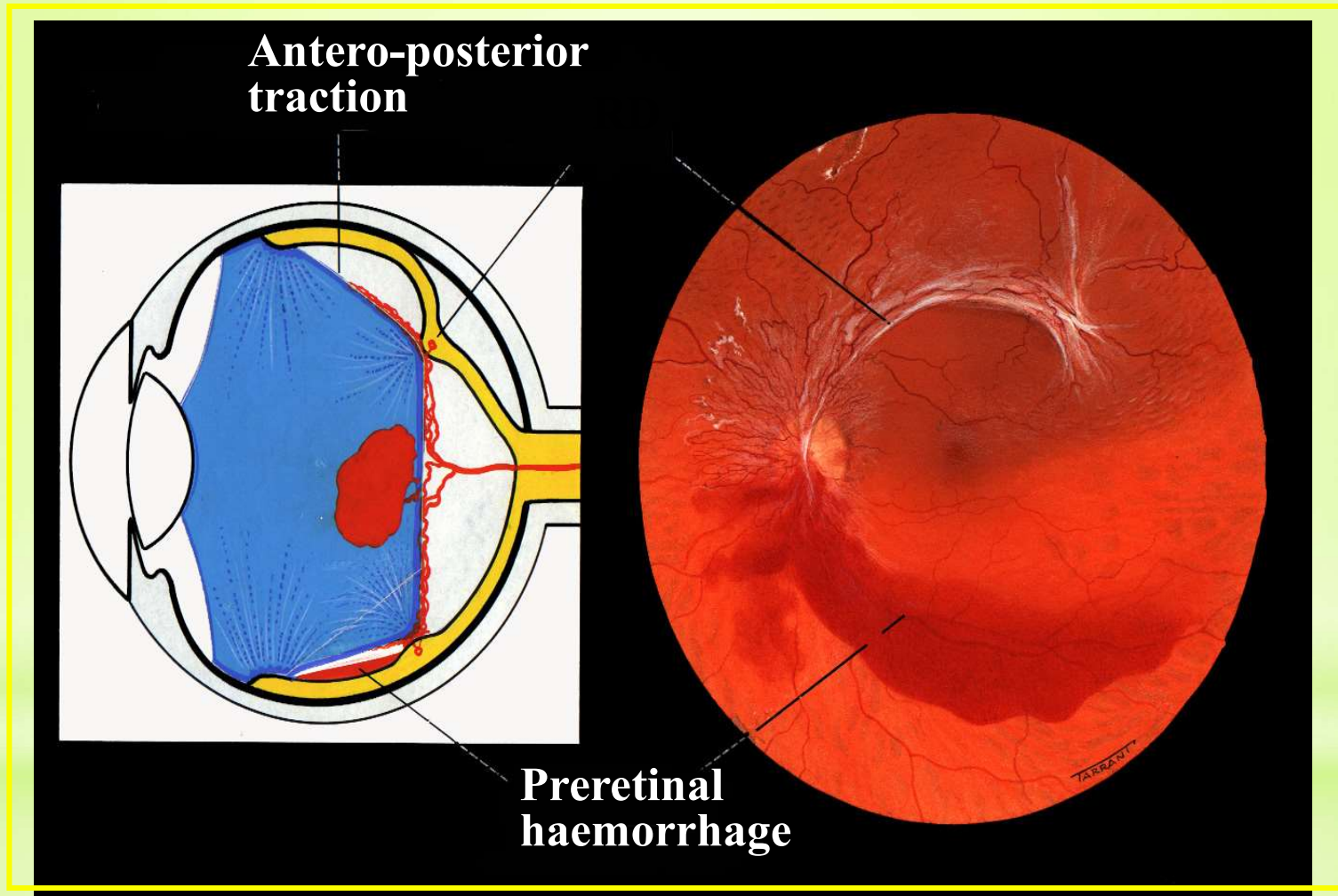


- Convex, deep mobile elevation extending to ora serrata
- Slightly opaque with dark blood vessels



- Loss of choroidal pattern
- Retinal breaks

Diabetic Tractional RD



Prophylactic Argon Laser Photocoagulation

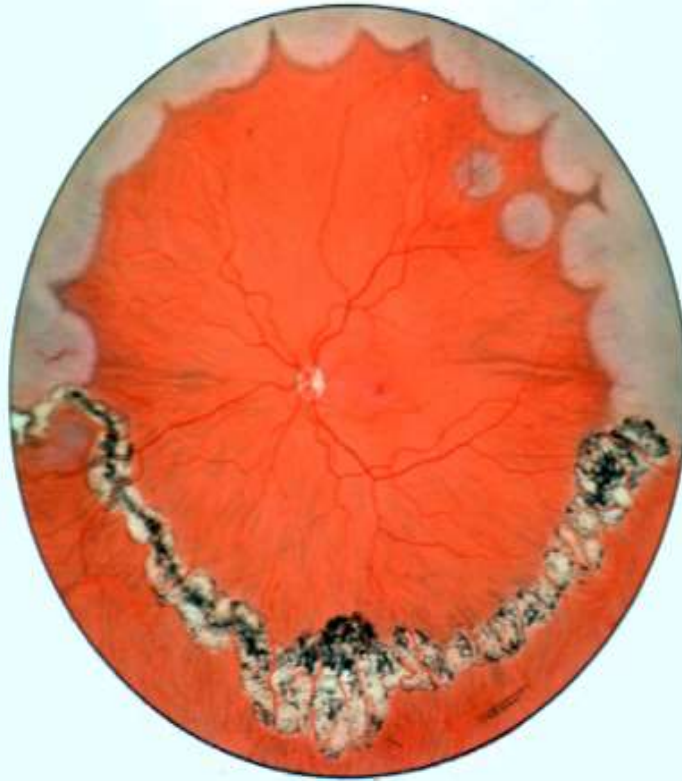


Surround lesion with two rows of confluent burns



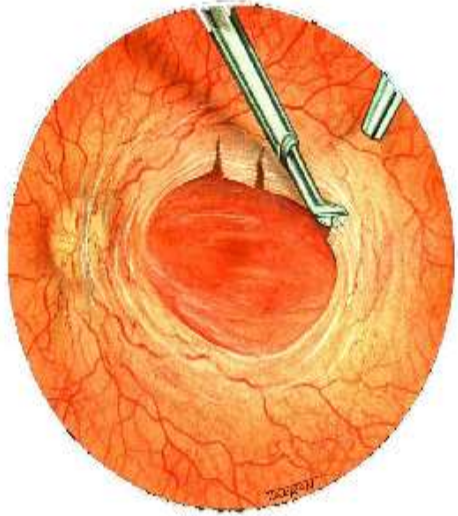
Difficult for anterior lesions and if media hazy

Cryotherapy

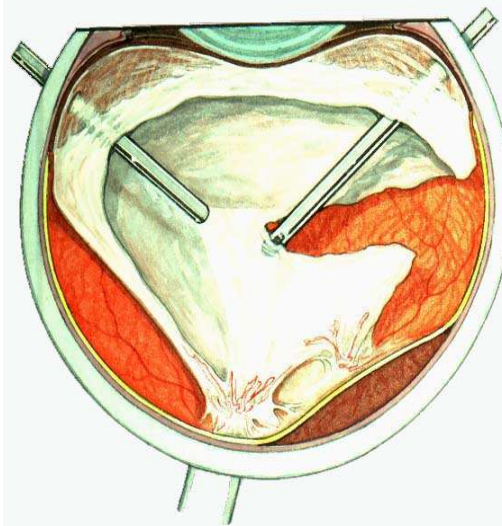


- **Surround lesion with single row of cryo-applications**
- **Preferred for treatment of large areas**

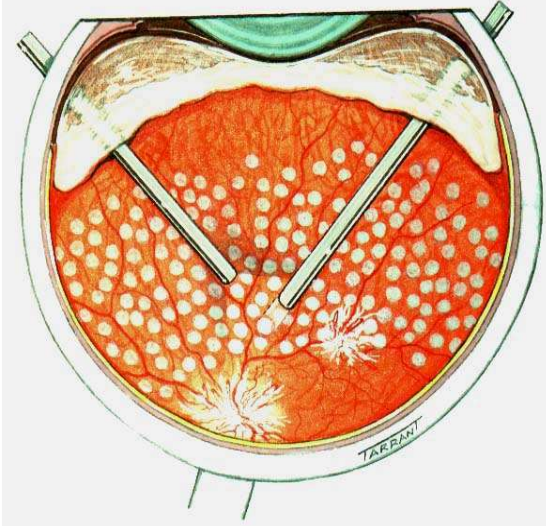
Vitrectomy and Endolaser



Release of circumferential traction

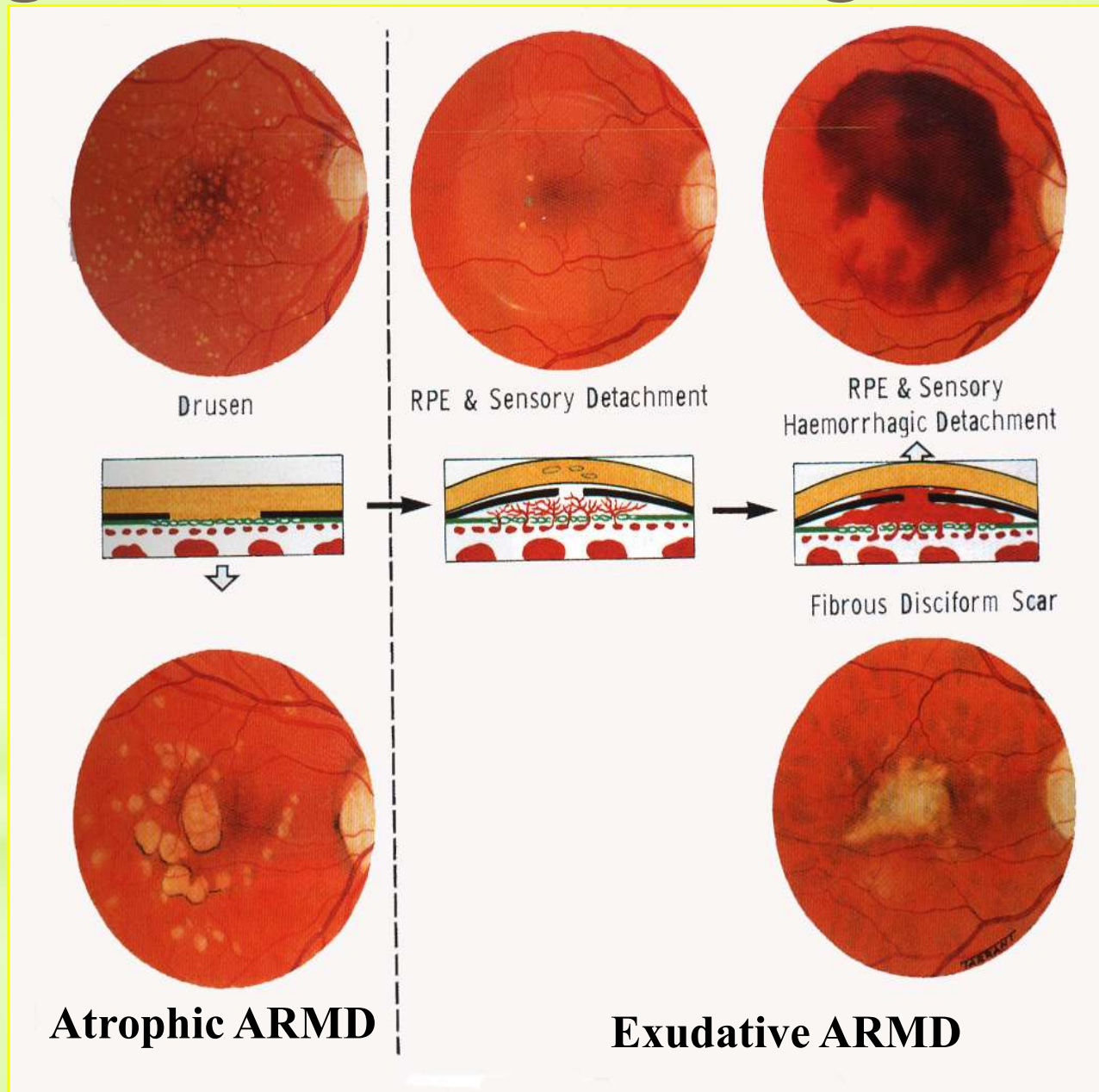


Release of antero-posterior traction



Endophotocoagulation

Age-Related Macular Degeneration



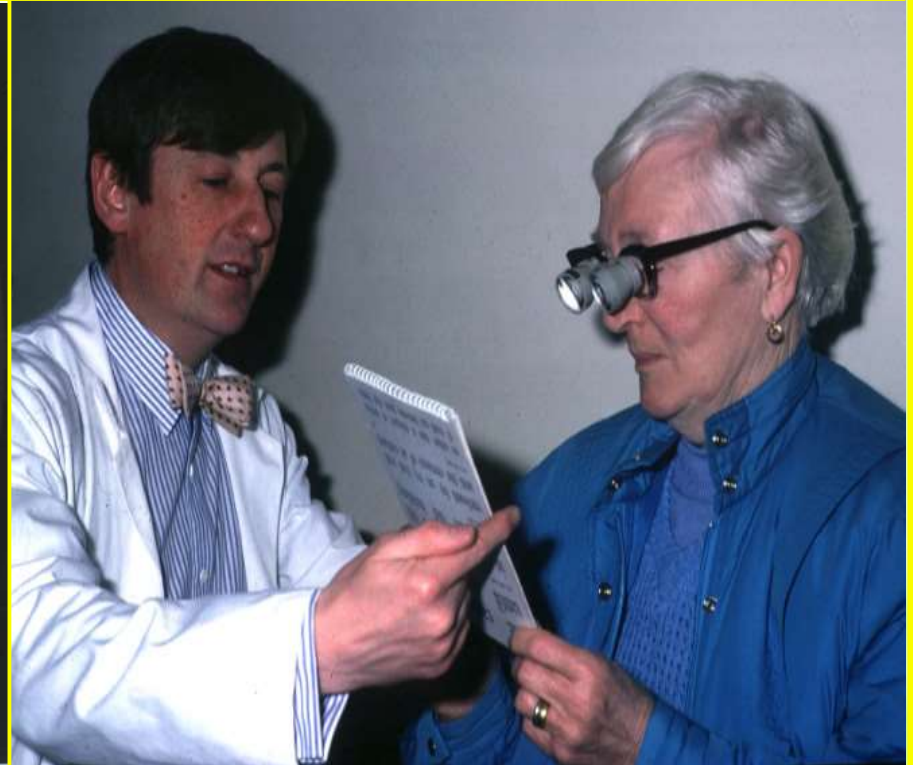
Age-related Macular Degeneration

Fluorescein angiogram



Hyperfluorescence

Management



Low-vision aids if appropriate

CORNEA

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Transparency of the Cornea

1. Absence of blood vessels
2. Regular arrangement of lamellae
3. Corneal dehydration by Endothelium pump system
4. Demyelination of Nerve Fibers
5. Non-Keratinized epithelium

Marginal keratitis

- Hypersensitivity reaction to *Staph.* exotoxins
- May be associated with *Staph.* blepharitis
- Unilateral, transient but recurrent

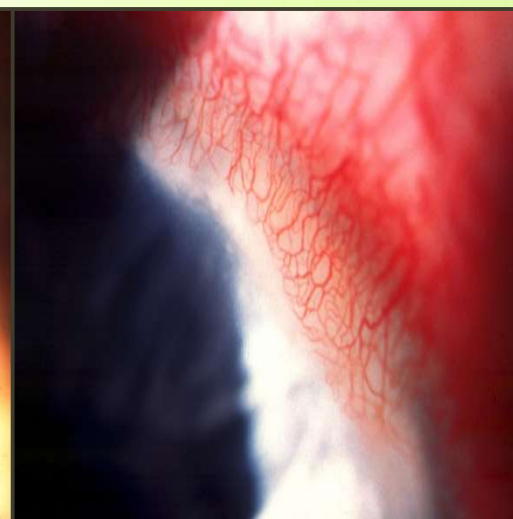
Progression



Subepithelial infiltrate
separated by clear zone



Circumferential spread



Bridging vascularization
followed by resolution

Treatment - short course of topical steroids

CORNEAL INFECTIONS

1. Bacterial keratitis
2. Fungal keratitis
3. Herpes simplex keratitis
 - Epithelial
 - Disciform
4. Herpes zoster keratitis

Bacterial keratitis

Predisposing factors

- Contact lens wear
- Chronic ocular surface disease
- Corneal hypoaesthesia



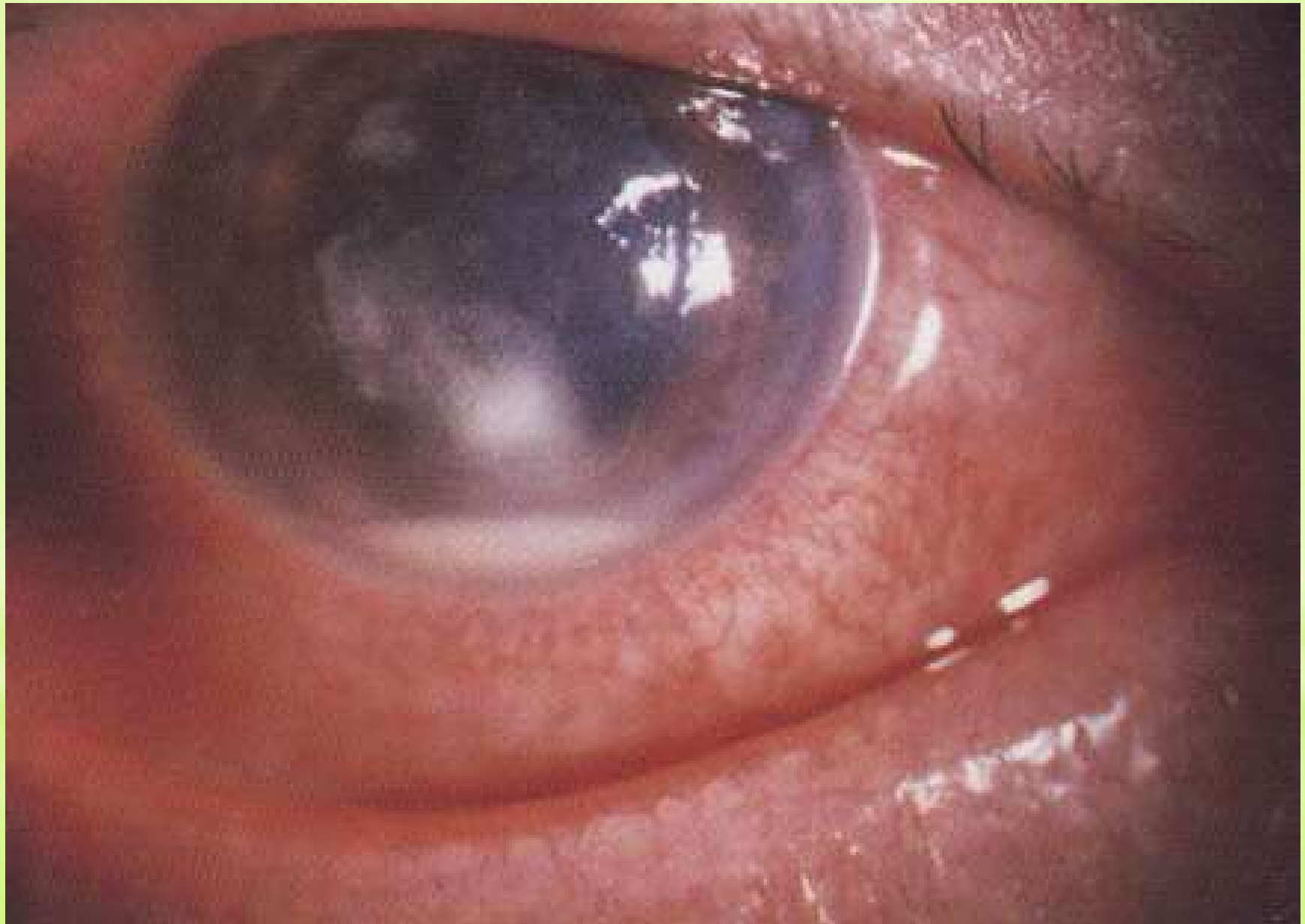
Expanding oval, yellow-white, dense stromal infiltrate



Stromal suppuration and hypopyon

Treatment - topical ciprofloxacin 0.3% or ofloxacin 0.3%

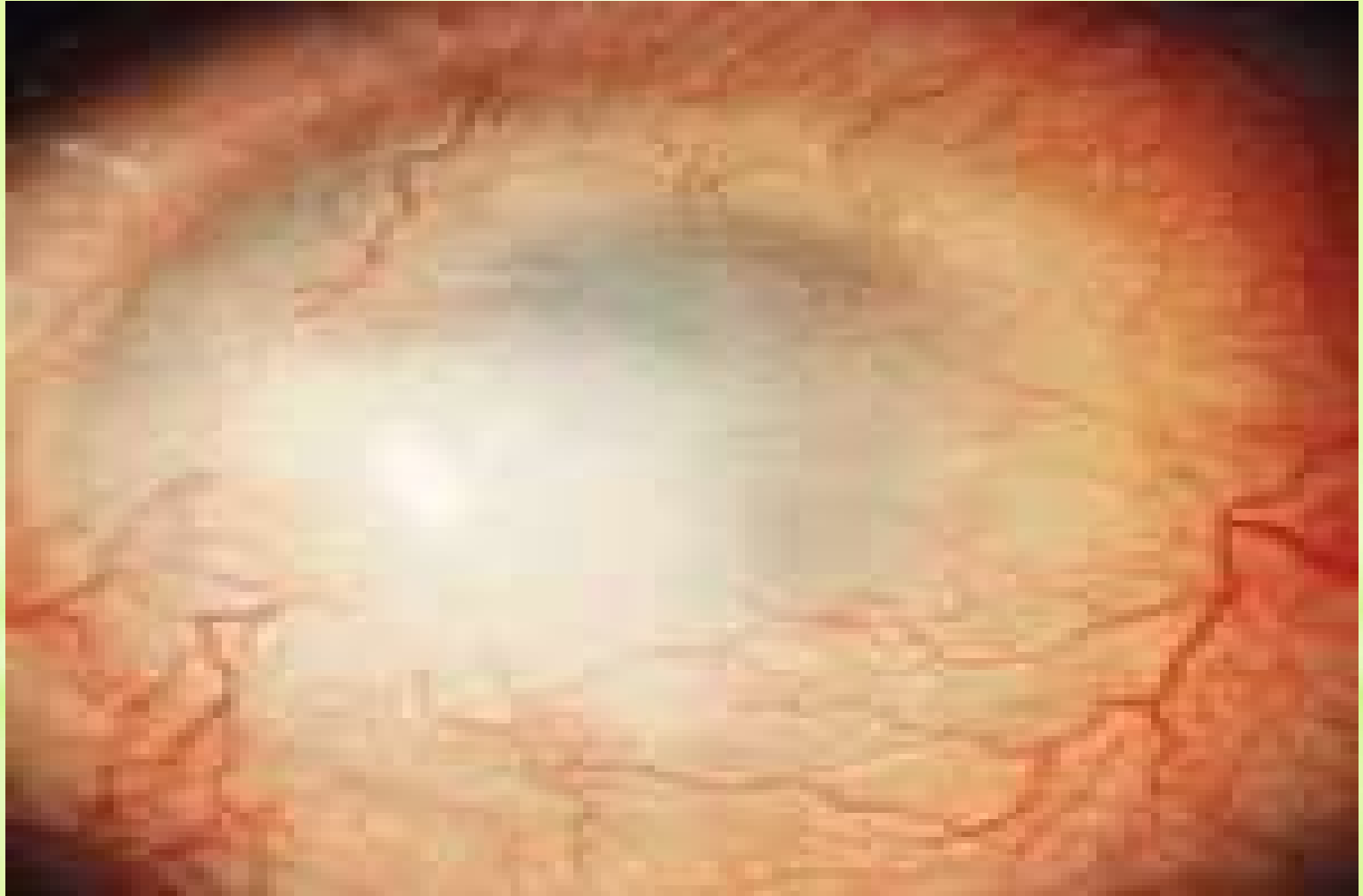
Corneal Ulcer with hypopyon



Severe bacterial keratitis with infectious scleritis



Abnormal Scars



Fungal keratitis

Frequently preceded by ocular trauma with organic matter



Greyish-white ulcer which may be surrounded by feathery infiltrates

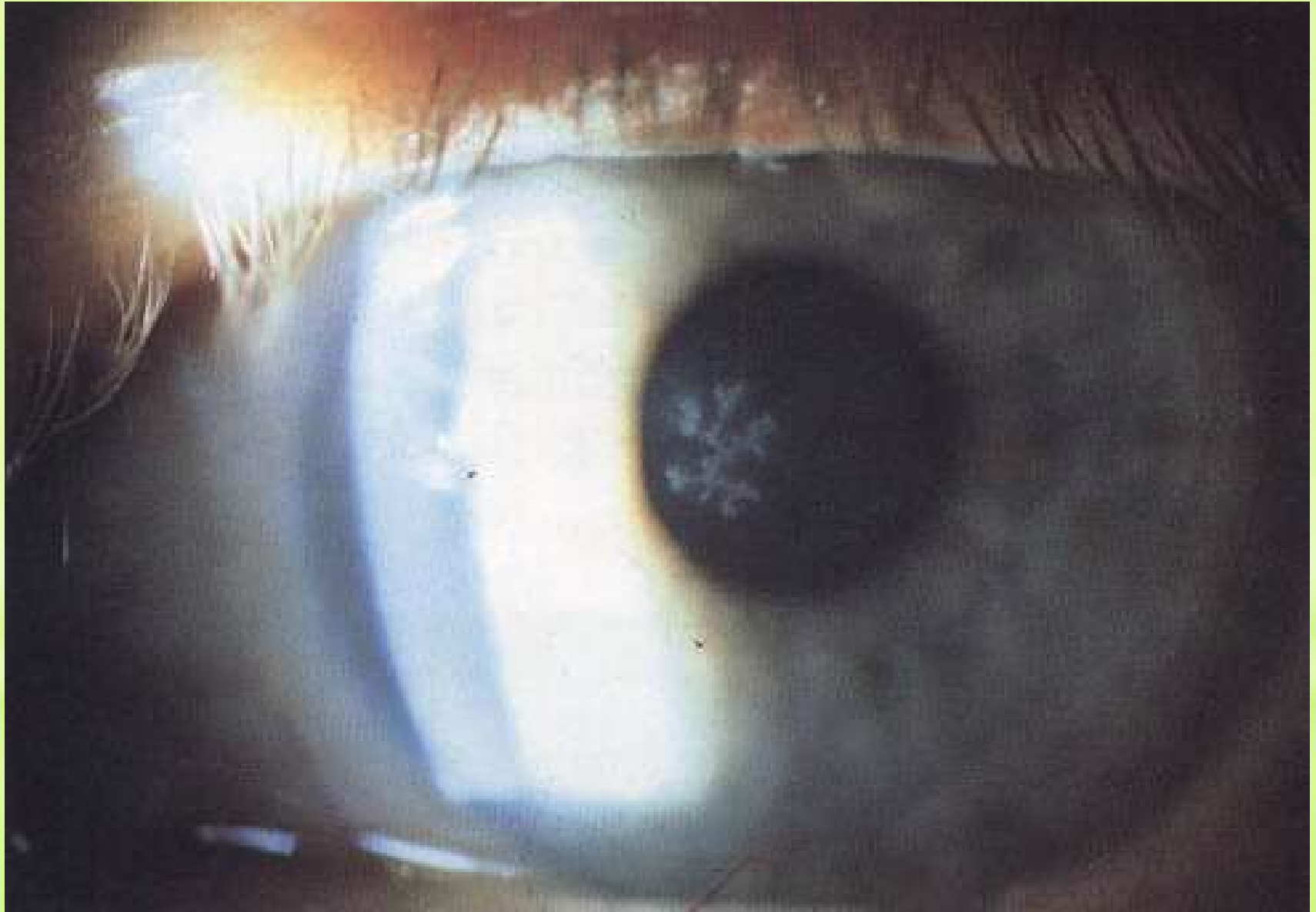


Slow progression and occasionally hypopyon

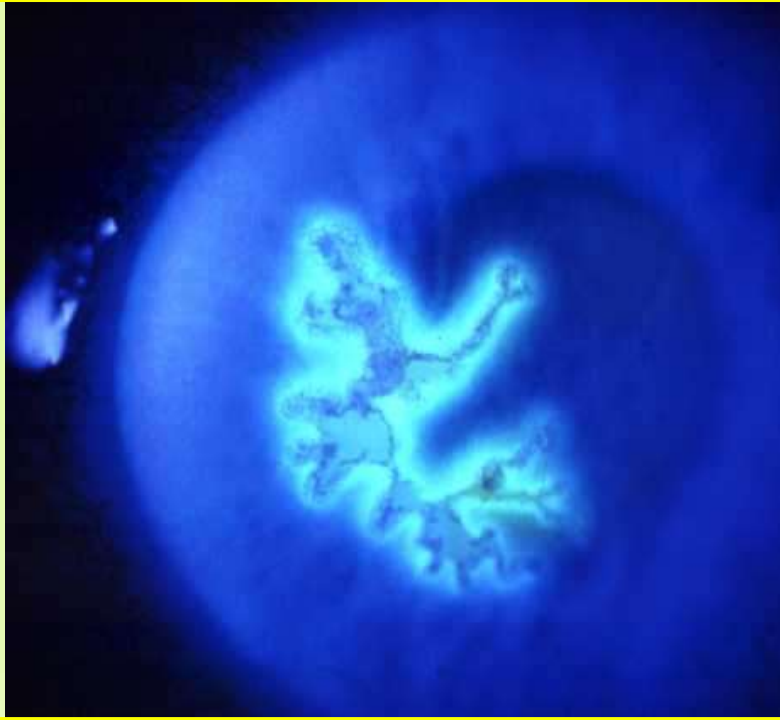
Treatment

- Topical antifungal agents
- Systemic therapy if severe
- Penetrating keratoplasty if unresponsive

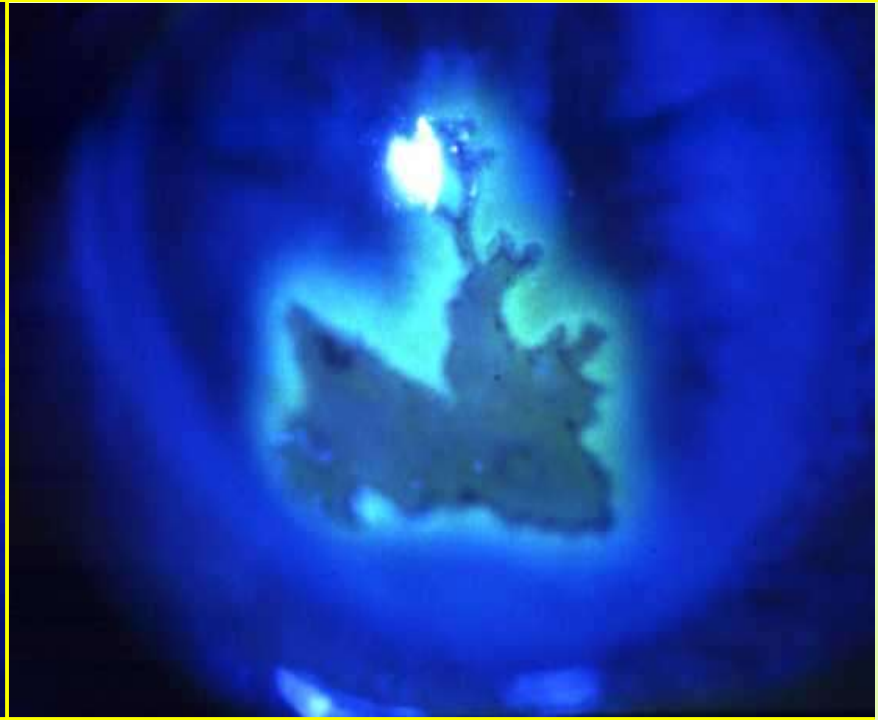
Herpetic Dendritic Ulcer



Herpes simplex epithelial keratitis



- Dendritic ulcer with terminal bulbs
- Stains with fluorescein



- May enlarge to become geographic

Treatment

- Aciclovir 3% ointment x 5 daily
- Trifluorothymidine 1% drops 2-hourly
- Debridement if non-compliant

Herpetic geographical ulcer



CORNEAL DEGENERATIONS

1. Age-related

- **Arcus senilis**

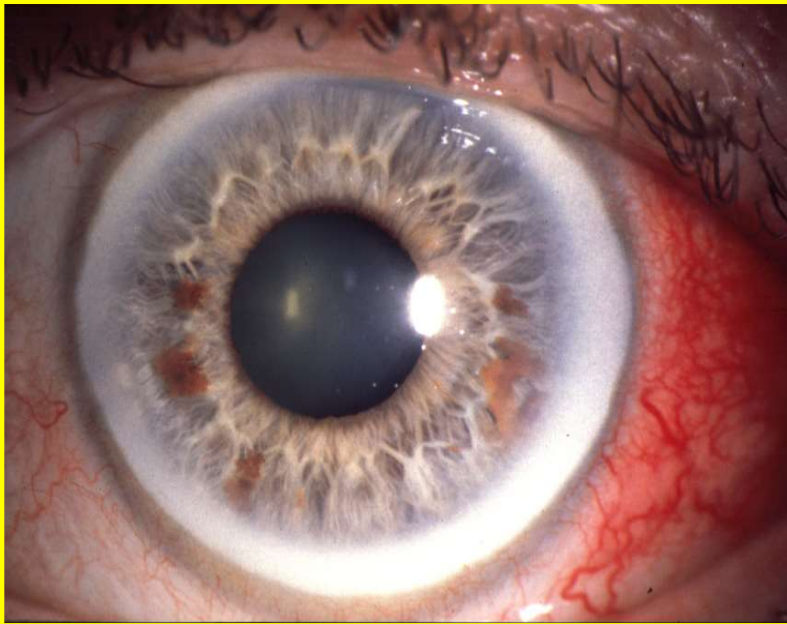
2. Lipid keratopathy

- **Primary**
- **Secondary**

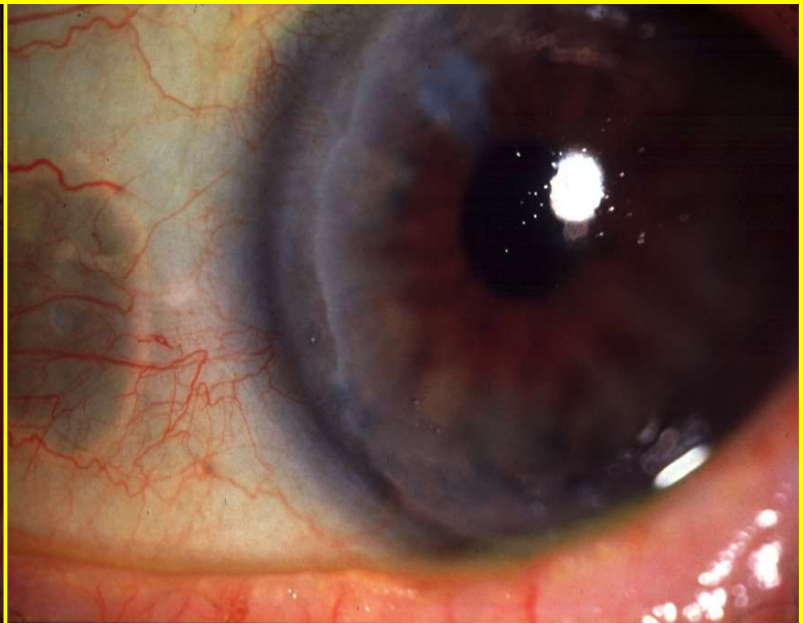
3. Band keratopathy

Arcus senilis

- **Innocuous and extremely common in elderly**
- **Occasionally associated with hyperlipoproteinaemia**



- **Bilateral, circumferential bands of lipid deposits**
- **Diffuse central and sharp peripheral border**



- **Peripheral border separated from limbus by clear zone**
- **Clear zone may be thinned (senile furrow)**

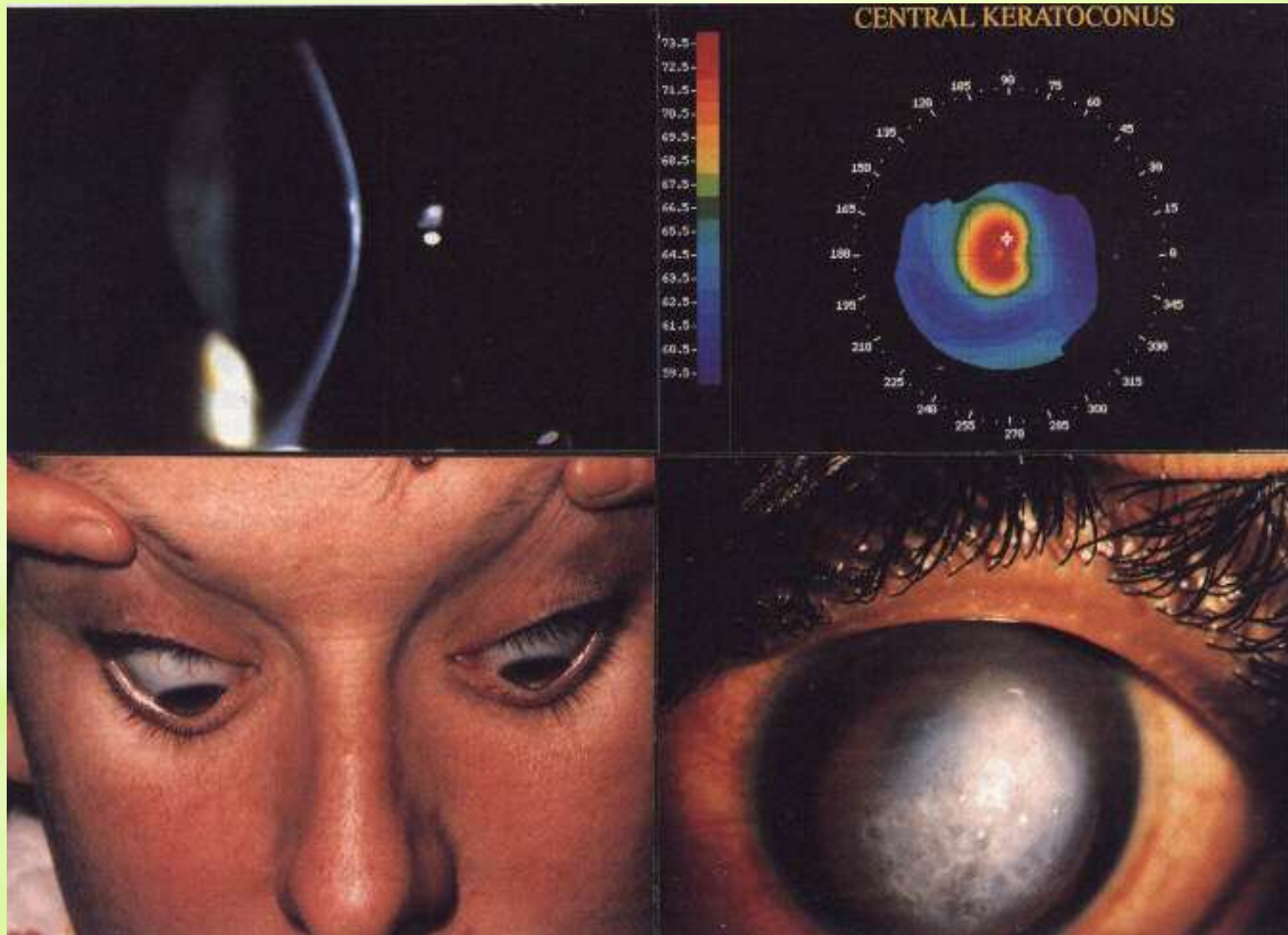
Keratoconus

Weakness of the cornea



Keratoconus:

Vogt's line; corneal mapping; Manson's sign; Hydrops



Manson's sign



Systemic associations of keratoconus



Atopic dermatitis



Down syndrome



Ehlers-Danlos syndrome



Marfan syndrome



Crouzon syndrome



Osteogenesis imperfecta

Keratoconus Treatment

- * Glasses
- * Contact Lenses
- * Crosslinking using Riboflavin and UVA
- * Corneal rings
- * Corneal Graft

CORNEAL SURGERY

1. Penetrating keratoplasty (PKP)

2. Refractive surgery

- **Photorefractive keratectomy (PRK)**
- **Laser in-situ keratomileusis (LASIK)**
- **Femtosecond LASIK / SMILE**

Penetrating Keratoplasty

1. Indications

- **Optical (e.g. bullous keratopathy, dystrophies)**
- **Tectonic (e.g. severe stromal thinning, descemetocoele)**
- **Therapeutic (e.g. severe keratitis)**
- **Cosmetic**

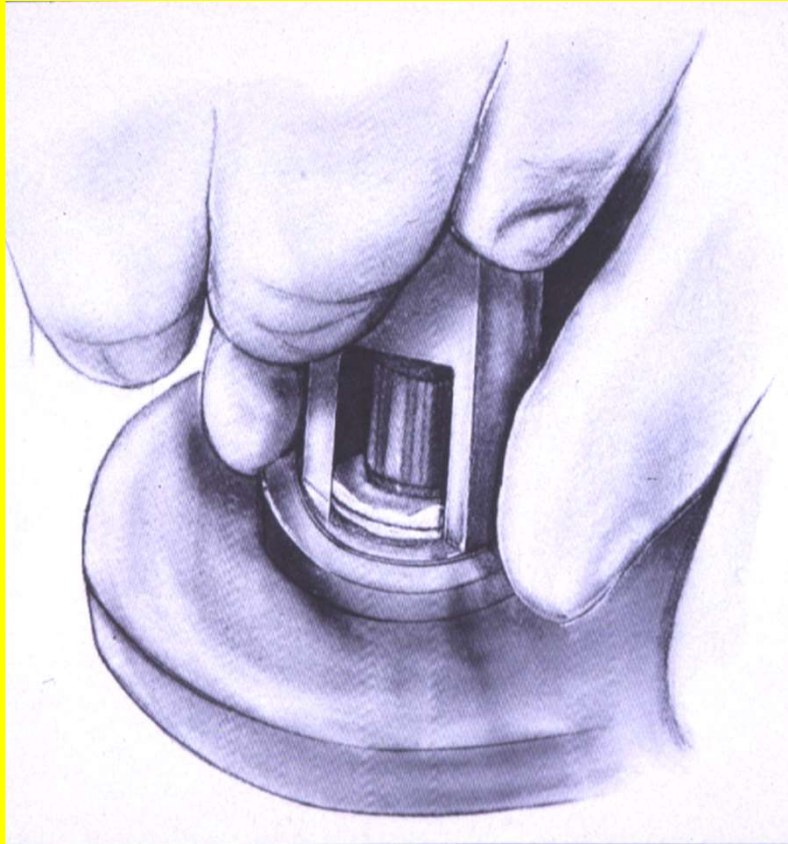
2. Adverse prognostic factors

- **Severe stromal vascularization**
- **Absence of corneal sensation**
- **Progressive conjunctival inflammation (e.g. pemphigoid)**
- **Tear film dysfunction**
- **Glaucoma**

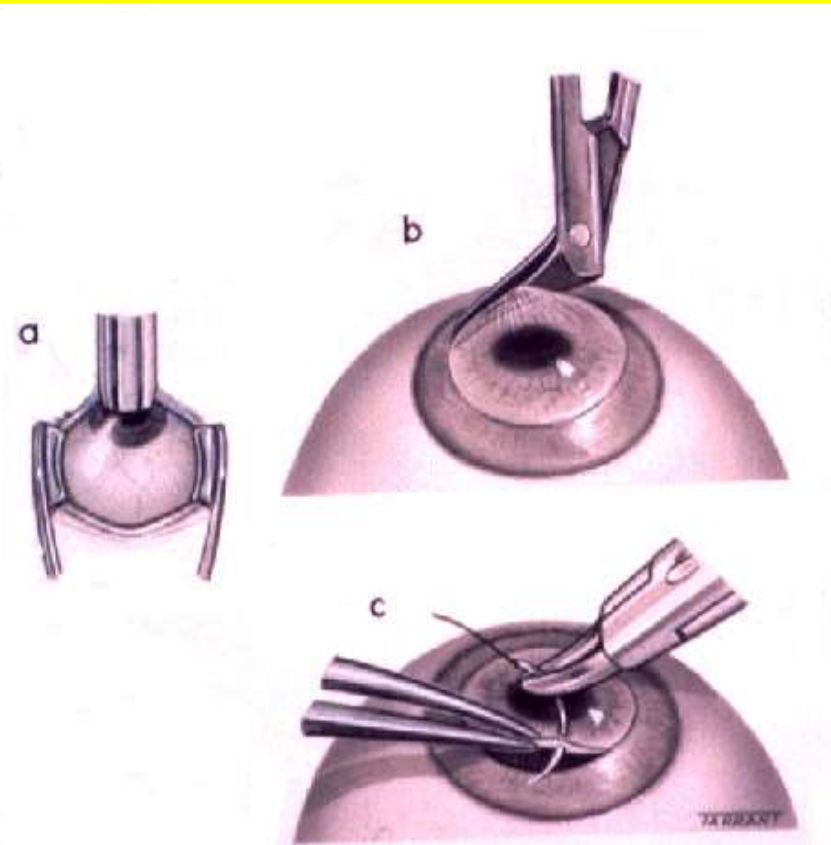
Corneal Graft



Technique of penetrating keratoplasty

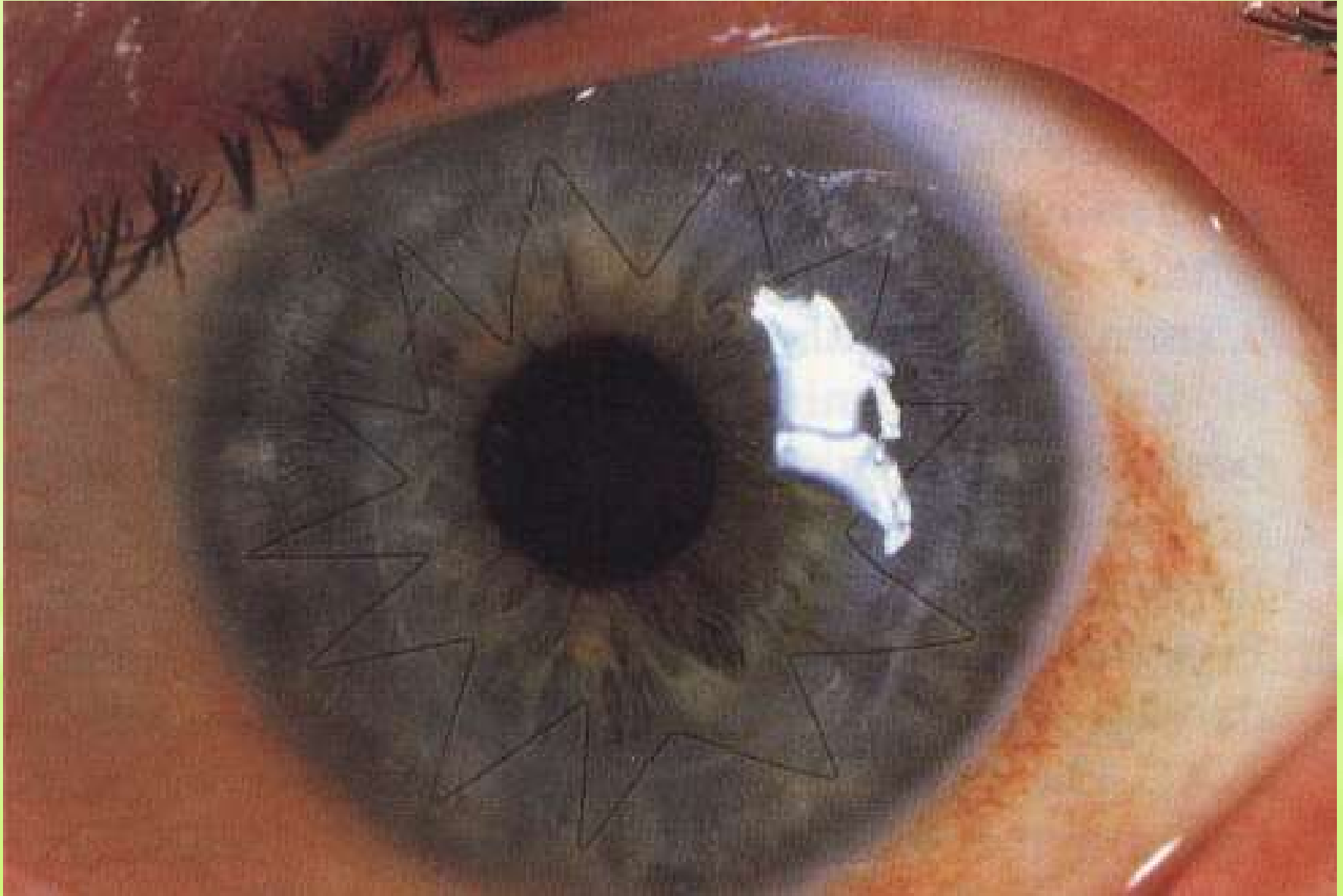


Excision of donor tissue



a, b - Excision of host tissue
c - Fixation of donor tissue

Corneal Graft

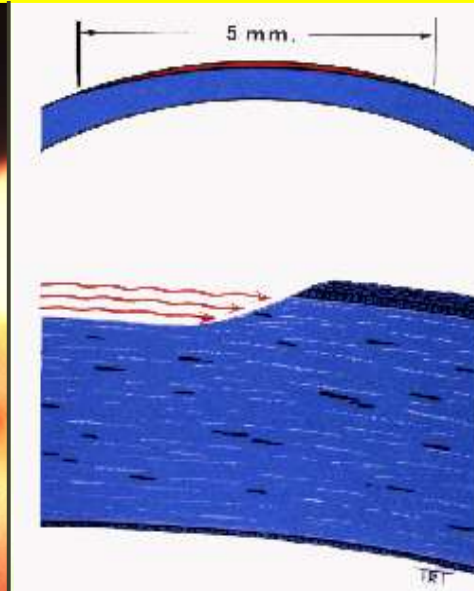
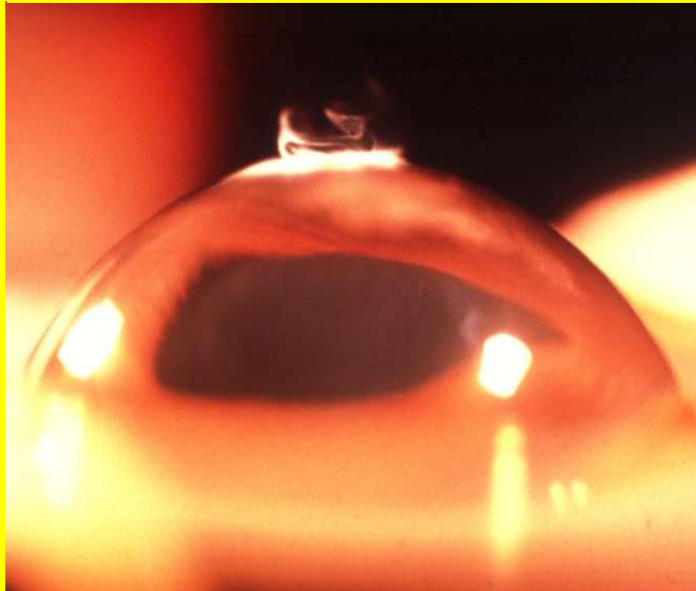


Photorefractive keratectomy (PRK)

Indications

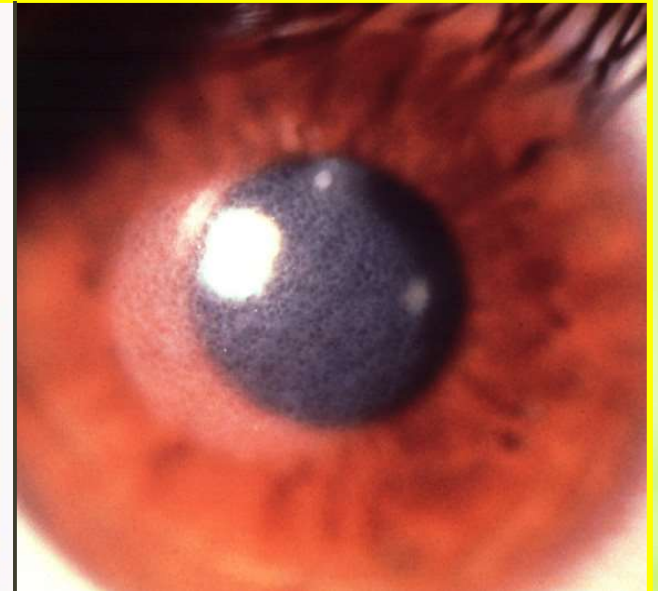
- Stable myopia up to 6D with astigmatism no more than 3D
- Hypermetropia up to 2.5D

Technique



Reshaping of cornea by excimer laser ablation of Bowman layer and anterior stroma

Main complication

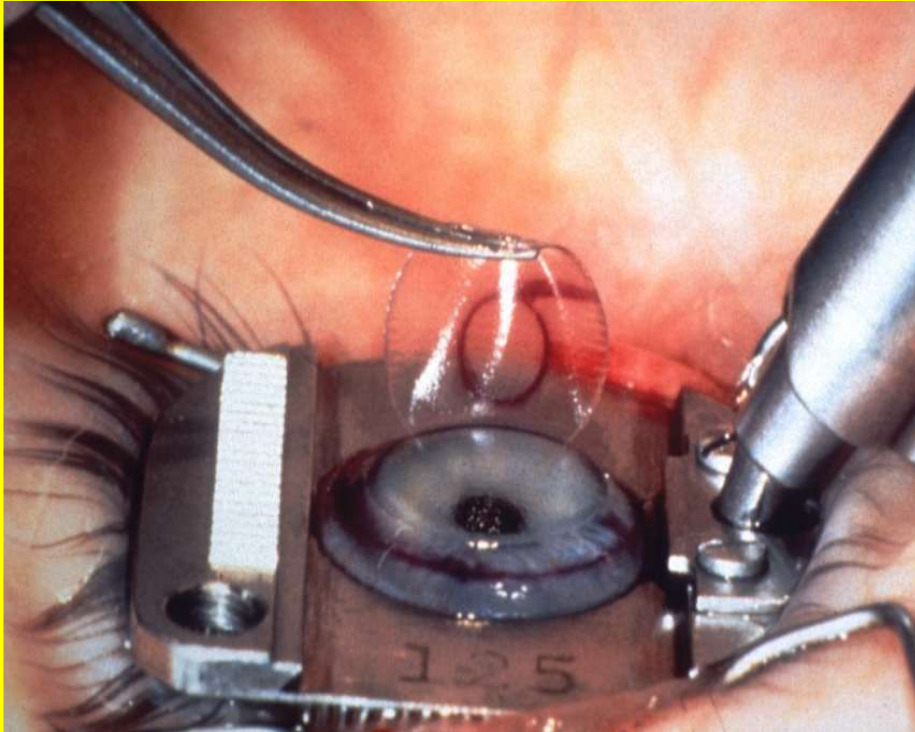


Subepithelial haze which usually resolves after 1-6 months

Laser *in-situ* keratomileusis (LASIK)

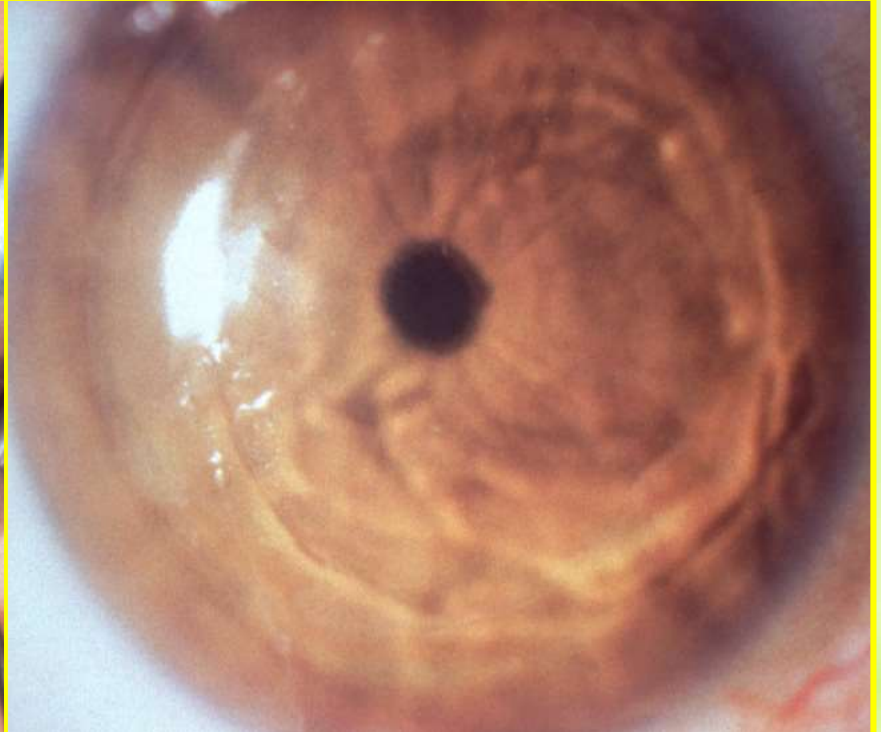
Indications - similar to PRK but corrects higher degrees of myopia

Technique



- Thin flap of cornea fashioned
- Bed treated with excimer laser
- Flap repositioned

Complications



- Wrinkles in flap
- Cellular interface proliferation

CONJUNCTIVA

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FRCSEd, FRCOphth

CONJUNCTIVAL INFECTIONS

1. Bacterial

- Simple bacterial conjunctivitis
- Gonococcal keratoconjunctivitis

2. Viral

- Adenoviral keratoconjunctivitis
- Molluscum contagiosum conjunctivitis
- Herpes simplex conjunctivitis

3. Chlamydial

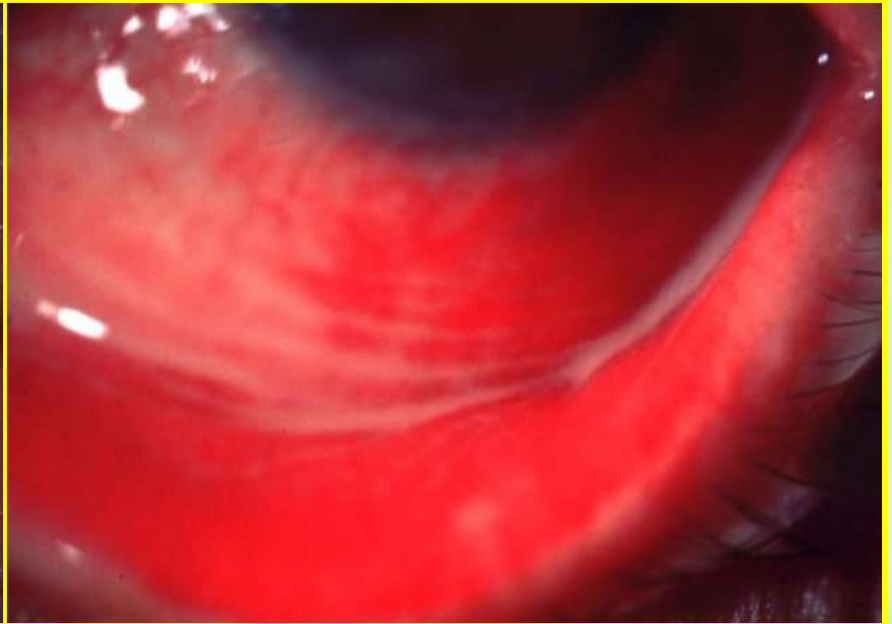
- Adult chlamydial keratoconjunctivitis
- Neonatal chlamydial conjunctivitis
- Trachoma

Simple bacterial conjunctivitis

Signs



Crusted eyelids and conjunctival injection



Subacute onset of mucopurulent discharge

Treatment - broad-spectrum topical antibiotics

Gonococcal keratoconjunctivitis

Signs



Acute, profuse, purulent discharge, hyperaemia and chemosis

Complications



Corneal ulceration, perforation and endophthalmitis if severe

Treatment

- Topical gentamicin and bacitracin
- Intravenous cefoxitin or cefotaxime

Adenoviral Keratoconjunctivitis

1. Pharyngoconjunctival fever

- Adenovirus types 3 and 7
- Typically affects children
- Upper respiratory tract infection
- Keratitis in 30% - usually mild

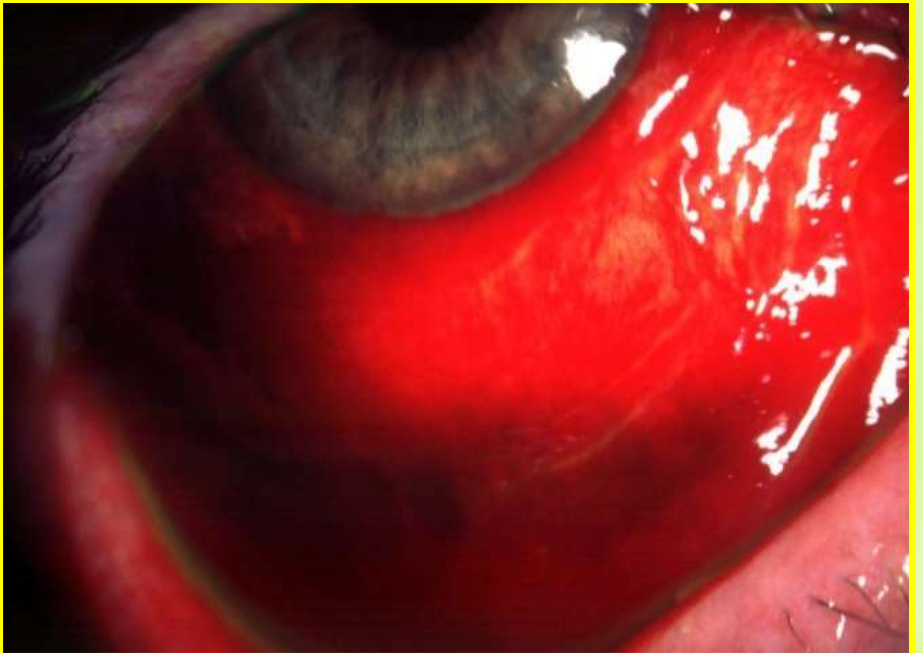
2. Epidemic keratoconjunctivitis

- Adenovirus types 8 and 19
- Very contagious
- No systemic symptoms
- Keratitis in 80% of cases - may be severe

Signs of conjunctivitis



Usually bilateral, acute watery discharge and follicles



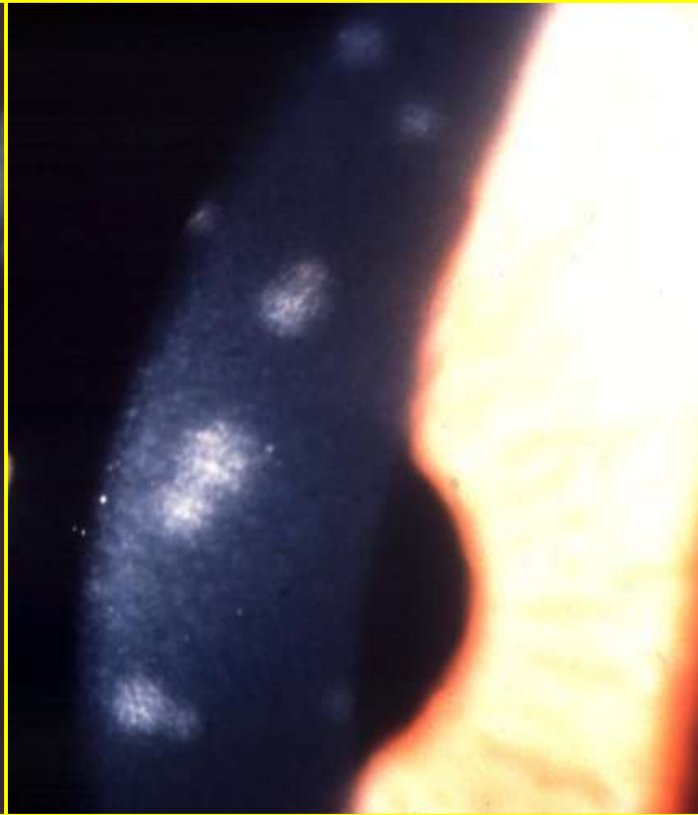
Subconjunctival haemorrhages and pseudomembranes if severe

Treatment - symptomatic

Signs of keratitis



- Focal, epithelial keratitis
 - Transient



- Focal, subepithelial keratitis
 - May persist for months

Treatment - topical steroids if visual acuity diminished by subepithelial keratitis

Trachoma

- Infection with serotypes A, B, Ba and C of *Chlamydia trachomatis*
- Fly is major vector in infection-reinfection cycle

Progression



Acute follicular conjunctivitis



Conjunctival scarring (Arlt line)



Herbert pits



Pannus formation



Trichiasis



Cicatricial entropion

Treatment - systemic Azithromycin

ALLERGIC CONJUNCTIVITIS

1. Vernal keratoconjunctivitis
2. Atopic keratoconjunctivitis

Vernal keratoconjunctivitis

Frequently associated with atopy: asthma, hay fever and dermatitis



- Recurrent, bilateral
- Affects children and young adults
- More common in males and in warm climates
- Itching, mucoid discharge and lacrimation

Types

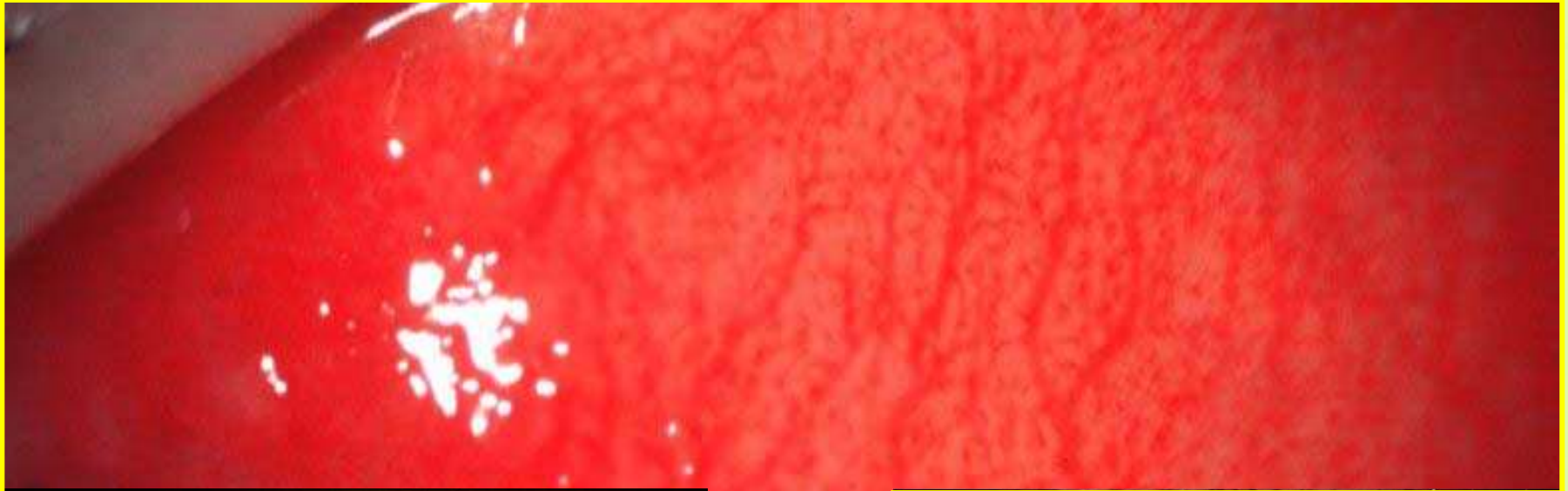
- Palpebral
- Limbal
- Mixed

Treatment

- Topical mast cell stabilizers
- Topical steroids

Progression of vernal conjunctivitis

Diffuse papillary hypertrophy, most marked on superior tarsus

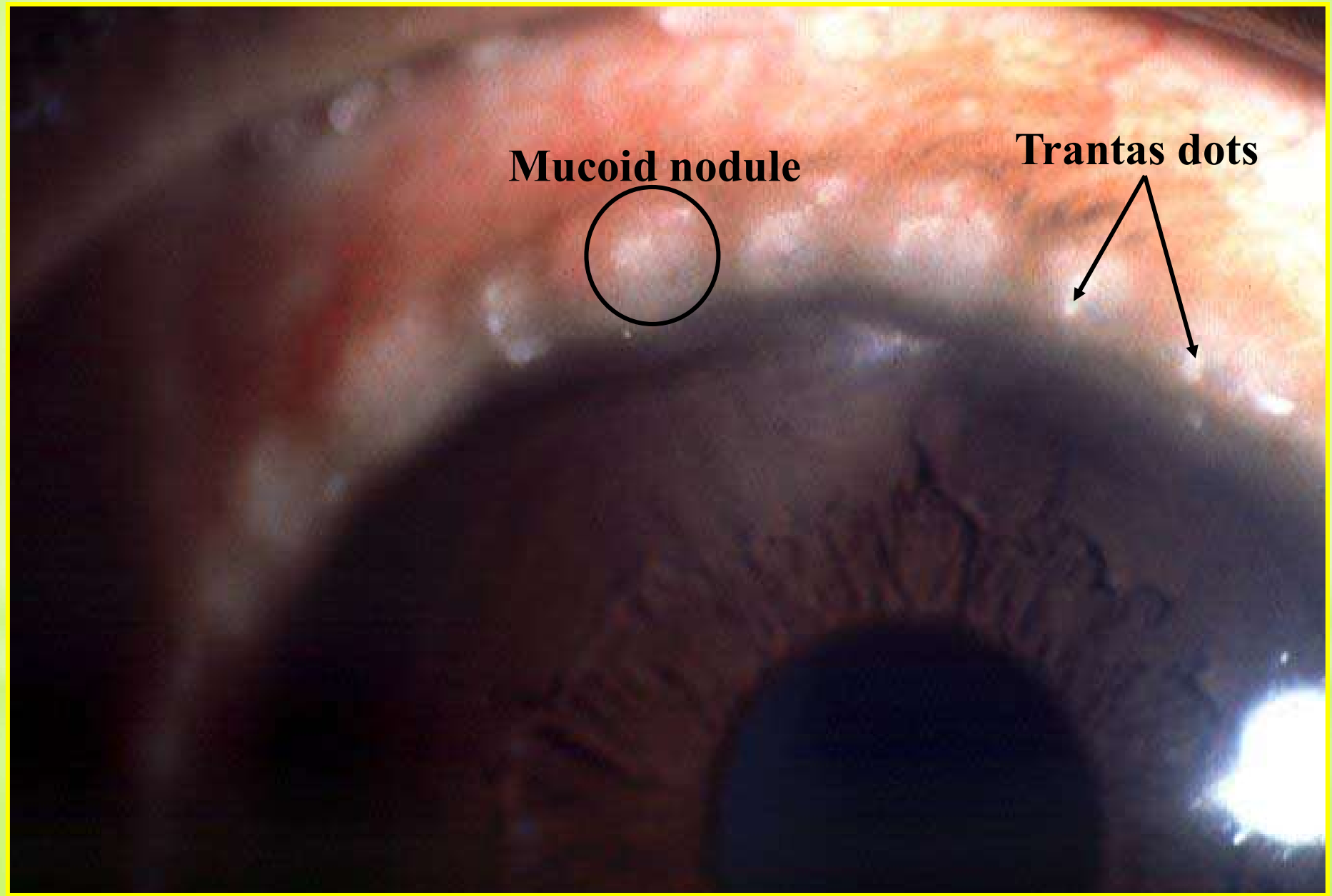


Formation of cobblestone papillae



Rupture of septae - giant papillae

Limbal vernal



Atopic keratoconjunctivitis



Typically affects young patients with atopic dermatitis



Eyelids are red, thickened, macerated and fissured

CONJUNCTIVAL TUMOURS

1. Benign

- Naevus
- Papilloma
 - Epibulbar dermoid
- Lipodermoid

2. Pre-malignant

- Primary acquired melanosis (PAM)
- Intraepithelial neoplasia (carcinoma *in situ*)

3. Malignant

- Melanoma
- Squamous cell carcinoma
 - Kaposi sarcoma

Conjunctival Naevus



- Presents in first two decades
- Sharply demarcated and slightly elevated



- Most frequently juxtalimbal
- 30% are almost non-pigmented

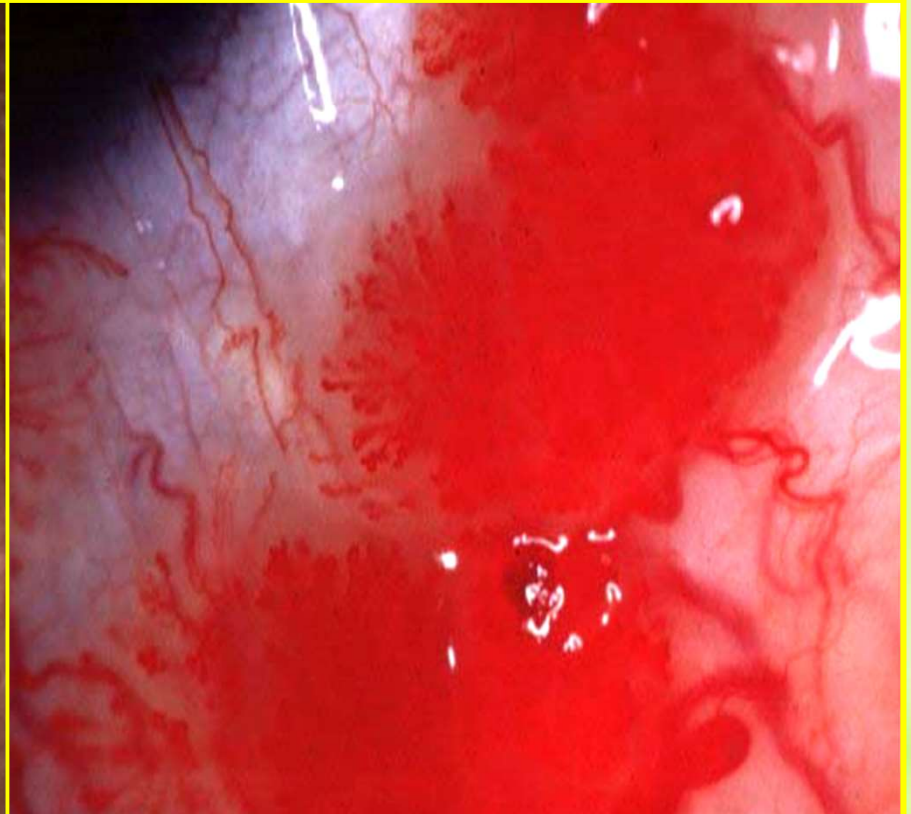
Papilloma

Pedunculated



- Presents in childhood or early adulthood
- Infection with papilloma virus
 - May be multiple and bilateral

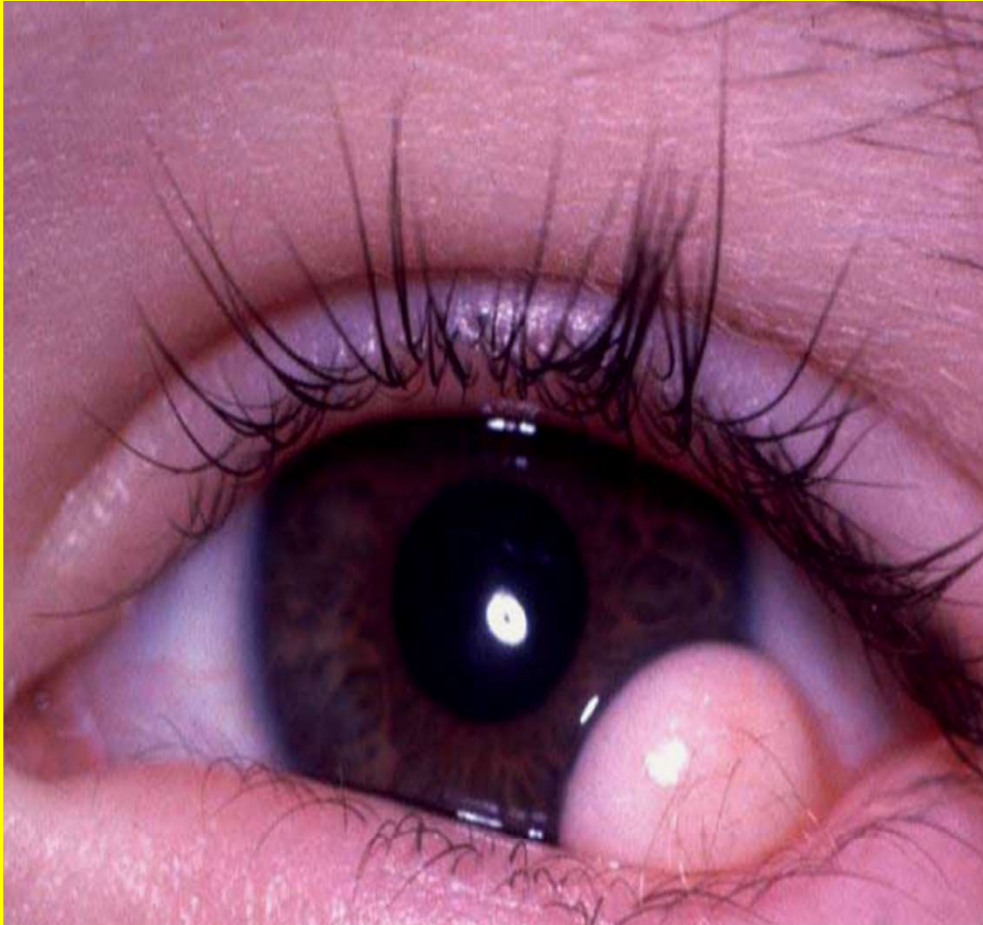
Sessile



- Presents in middle age
- Not caused by infection
 - Single and unilateral

Epibulbar dermoid

Signs



- Presents in childhood
- Smooth, soft mass
- Usually juxtalimbal

Association



- Occasionally Goldenhar syndrome

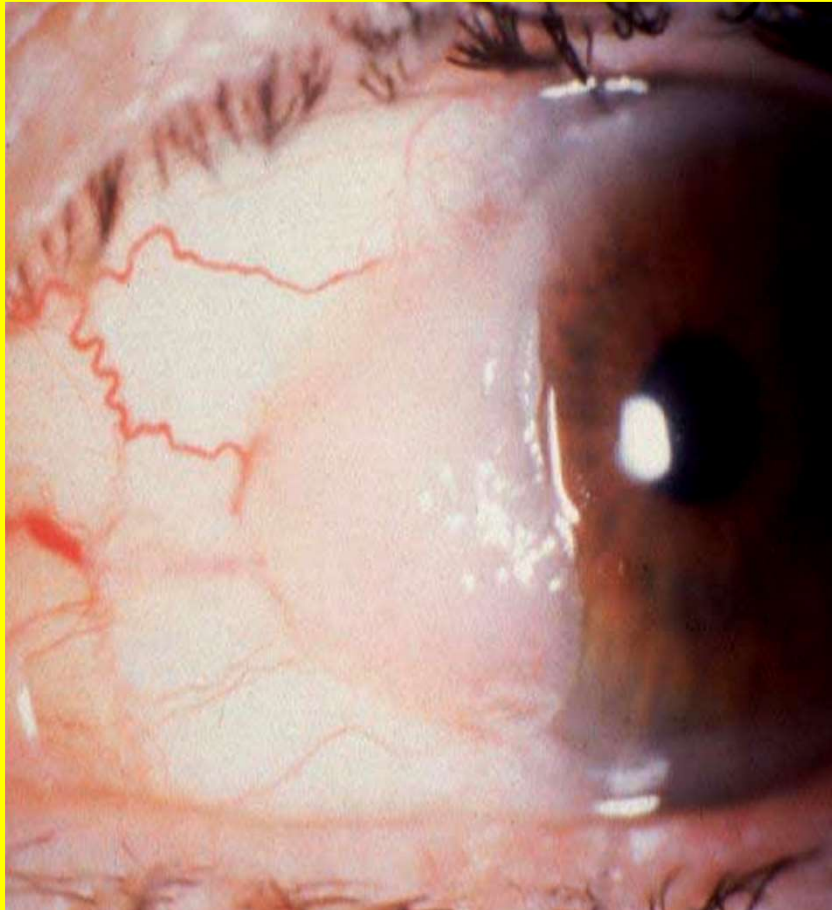
Lipodermoid



- Presents in adulthood
- Soft, movable, subconjunctival mass
- Most frequently at outer canthus

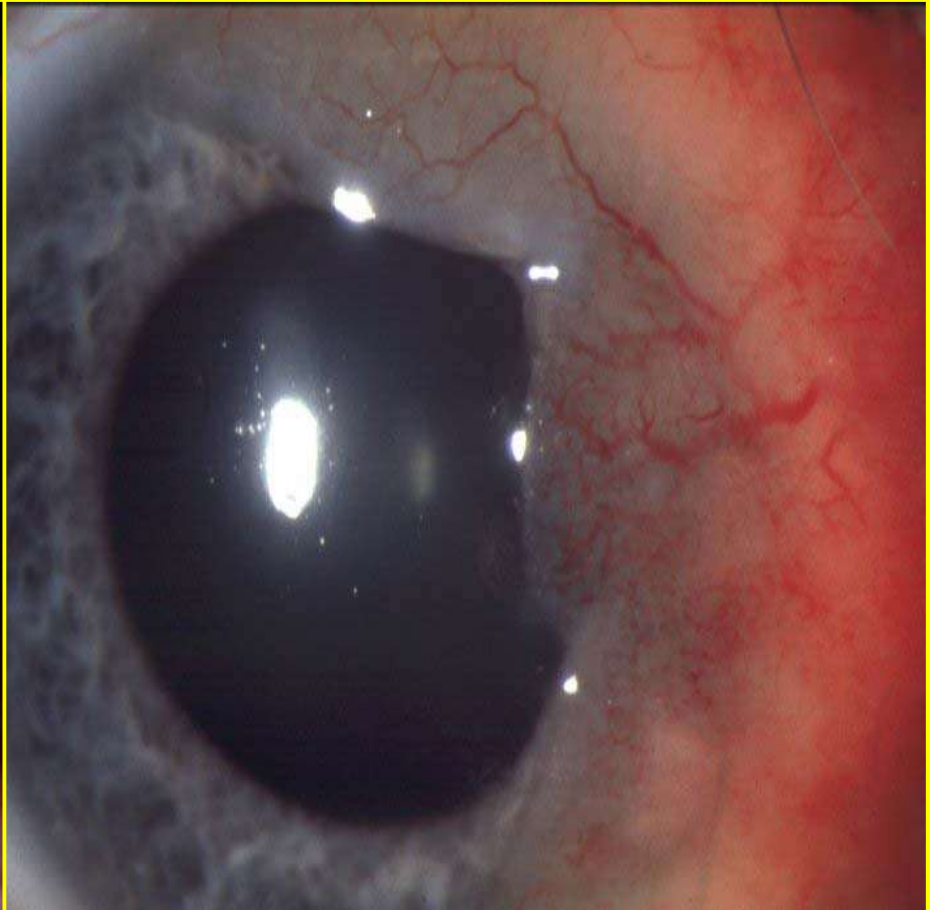
Intraepithelial neoplasia (carcinoma *in situ*)

Signs



- Presents in late adulthood
- Juxtalimbal fleshy avascular mass

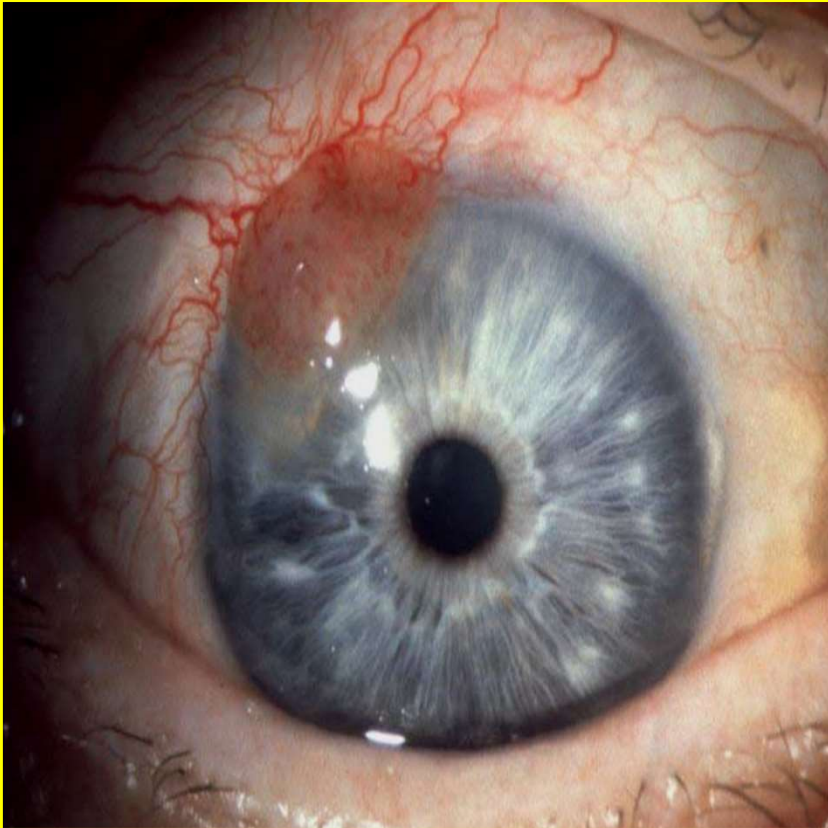
Progression



- May become vascular and extend onto cornea
- Malignant transformation is uncommon

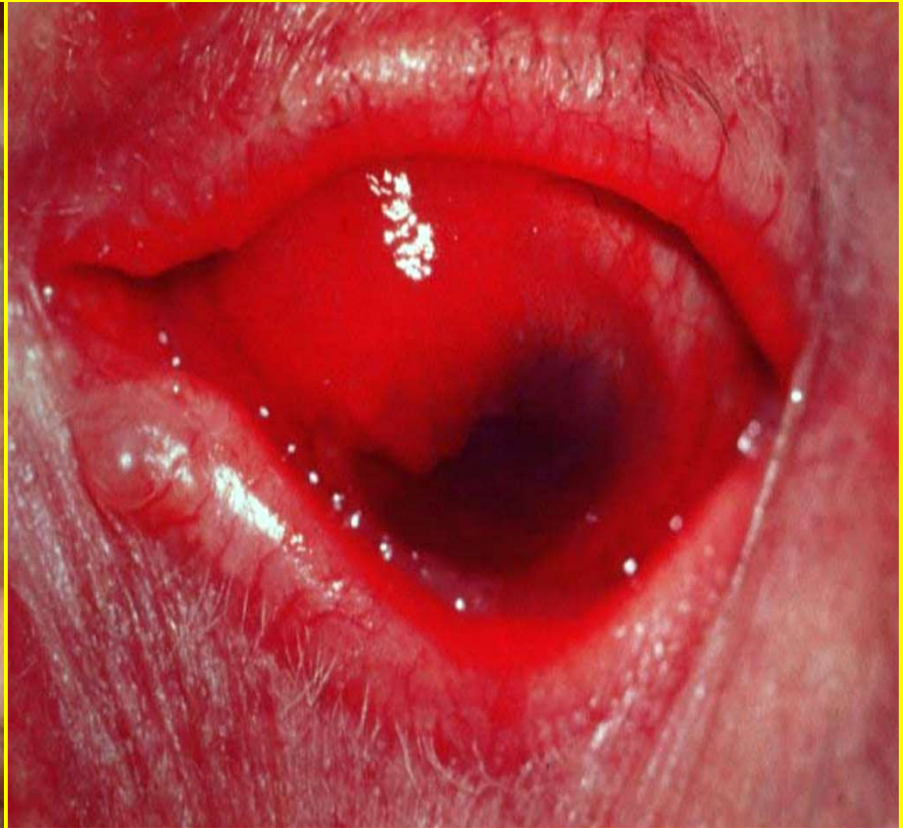
Squamous cell carcinoma

Signs



- Arises from intraepithelial neoplasia or *de novo*
- Presents in late adulthood
- Frequently juxtalimbal

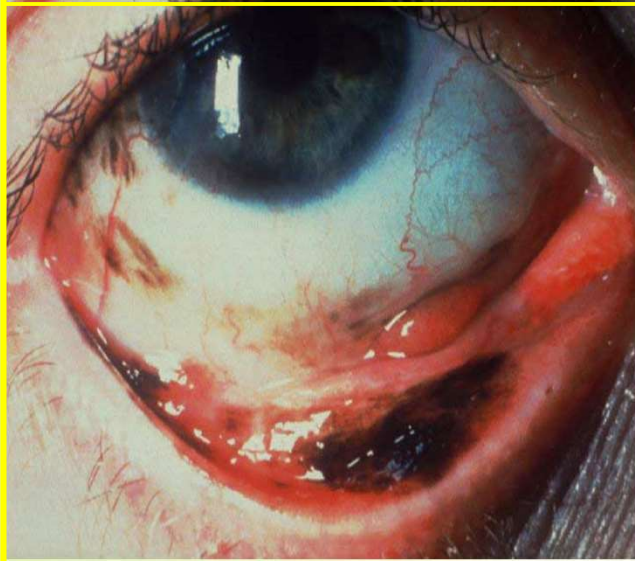
Progression



- Slow-growing
- May spread extensively
- Rarely metastasizes

Conjunctival melanoma

From PAM with atypia



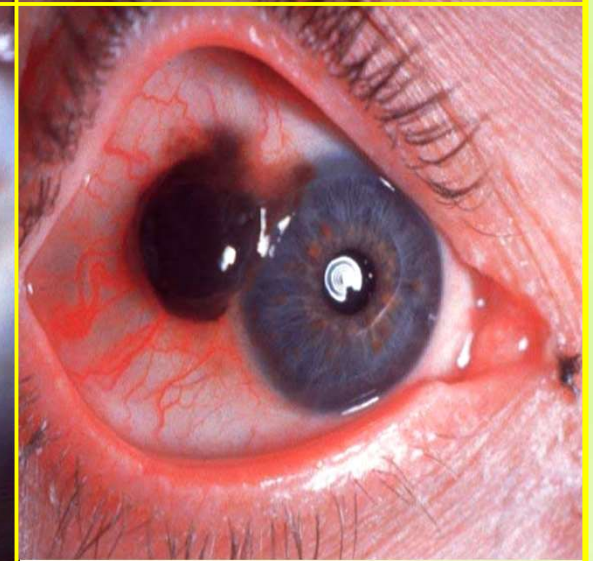
- Most common type
- Sudden appearance of nodules in PAM

From naevus



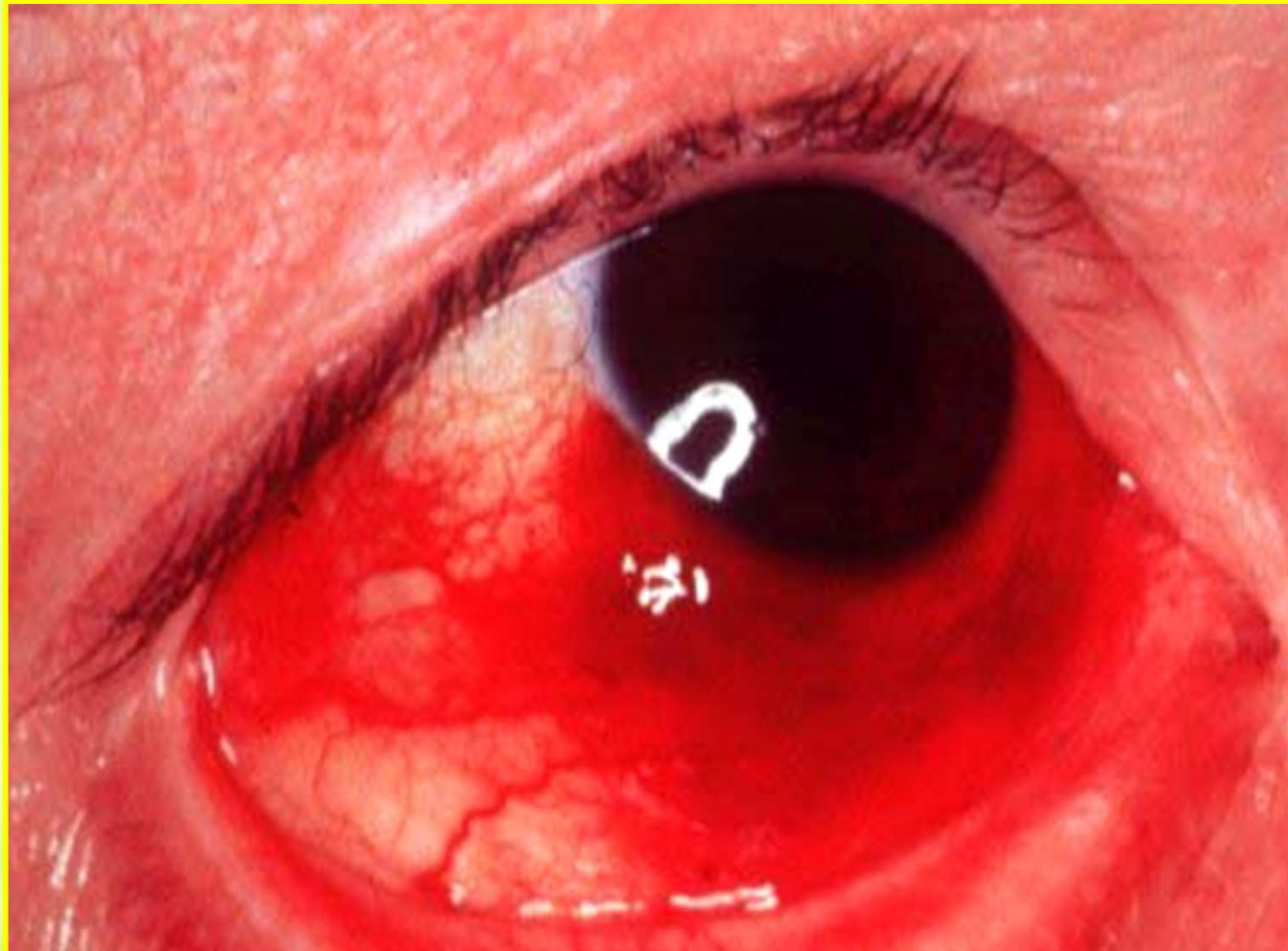
- Very rare
- Sudden increase in size or pigmentation

Primary



- Solitary nodule
- Frequently juxtalimbal but may be anywhere

Kaposi sarcoma



- Affects patients with AIDS
- Vascular, slow-growing tumour of low malignancy
 - Very sensitive to radiotherapy
 - Most frequently in inferior fornix

SCLERA

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FRCSEd, FRCOphth

EPISCLERITIS AND SCLERITIS

1. Episcleritis

- Simple
- Nodular

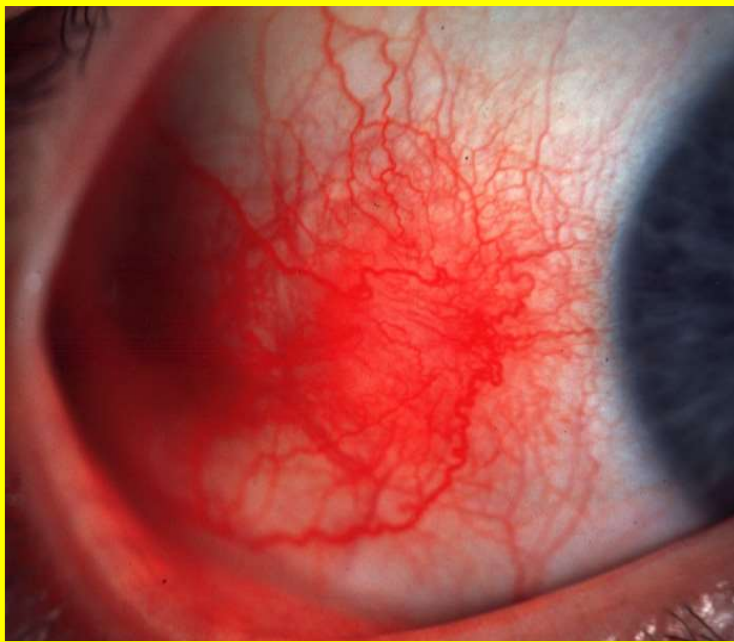
2. Anterior scleritis

- Non-necrotizing diffuse
- Non-necrotizing nodular
- Necrotizing with inflammation
- Necrotizing without inflammation
(scleromalacia perforans)

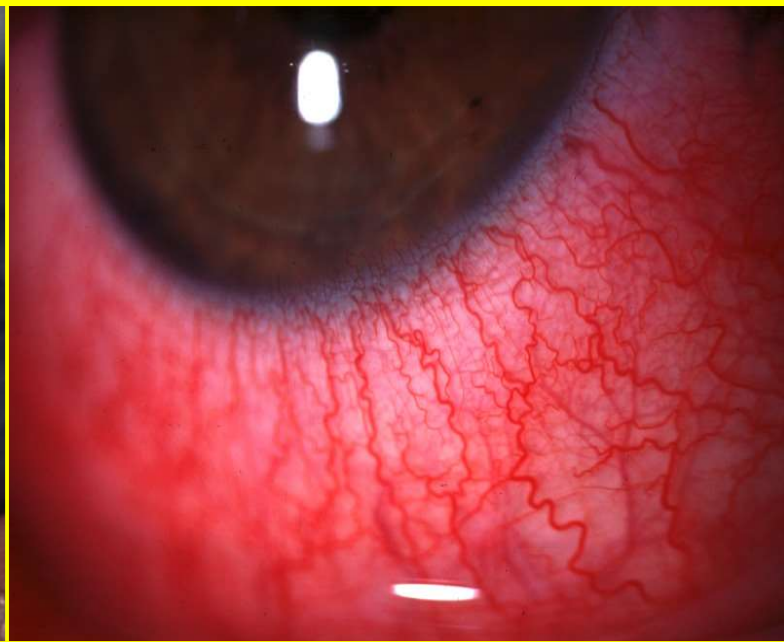
3. Posterior scleritis

Simple episcleritis

- Common, benign, self-limiting but frequently recurrent
- Typically affects young adults
- Seldom associated with a systemic disorder



Simple sectorial episcleritis



Simple diffuse episcleritis

Treatment

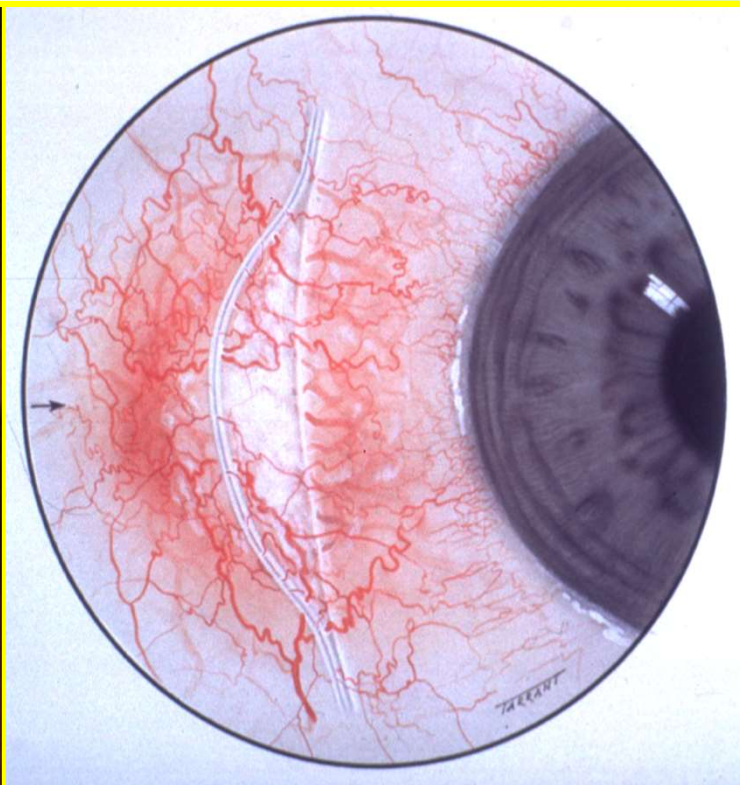
- Topical steroids
- Systemic flurbiprofen (400 mg tid if unresponsive

Nodular episcleritis

- Less common than simple episcleritis
- May take longer to resolve
- Treatment - similar to simple episcleritis



Localized nodule which can be moved over sclera



Deep scleral part of slit-beam not displaced

Causes and Systemic Associations of Scleritis

1. Rheumatoid arthritis

2. Connective tissue disorders

- **Wegener granulomatosis**
- **Polyteritis nodosa**
- **Systemic lupus erythematosus**

3. Miscellaneous

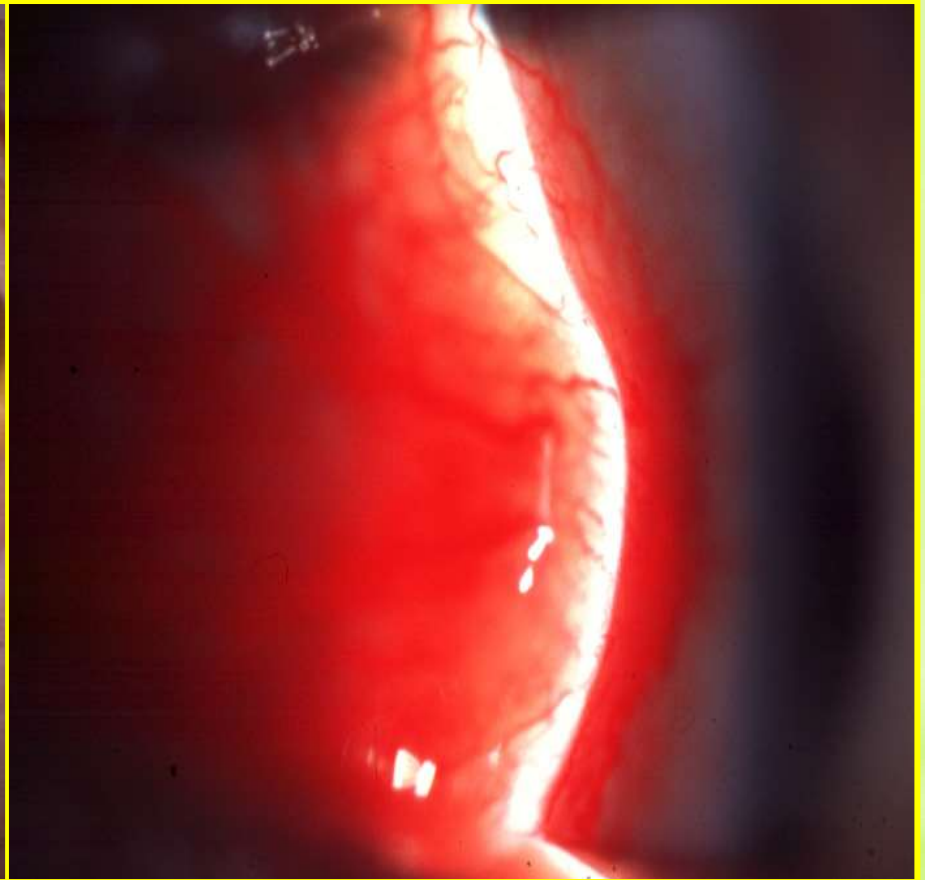
- **Relapsing polychondritis**
- **Herpes zoster ophthalmicus**
- **Surgically induced**

Nodular anterior non-necrotizing scleritis

More serious than diffuse scleritis



On cursory examination resembles nodular episcleritis



Scleral nodule cannot be moved over underlying tissue

Treatment - similar to diffuse non-necrotizing scleritis

EYELIDS

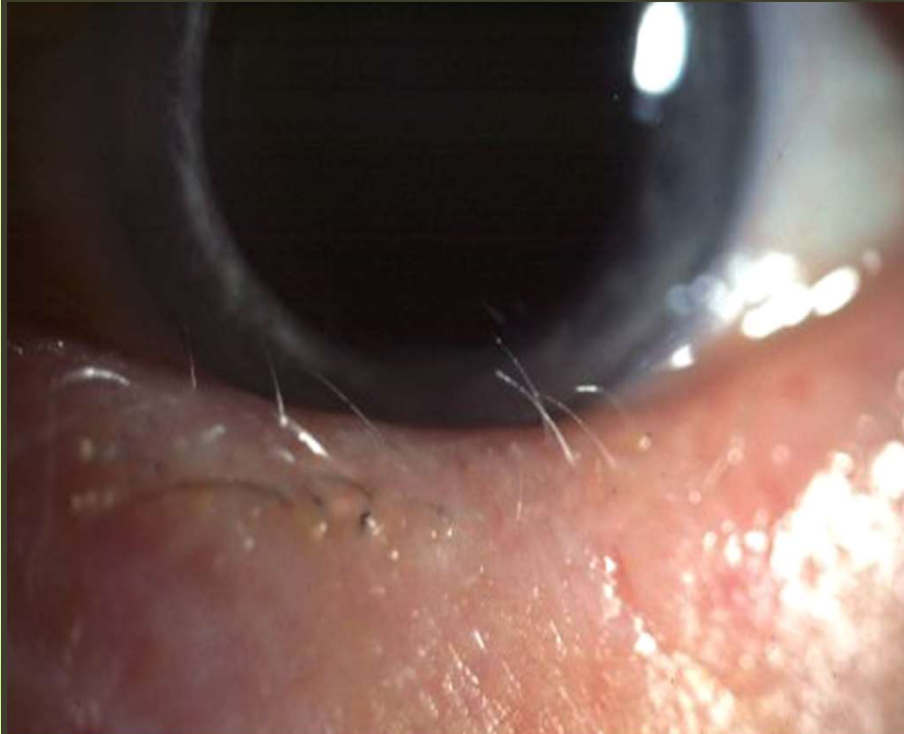
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DISORDERS OF LASHES

- 1. Trichiasis**
- 2. Distichiasis**
- 3. Madarosis**
- 4. Poliosis**

Trichiasis

Signs



- Posterior misdirection of normal lashes
- Most frequently affects lower lid

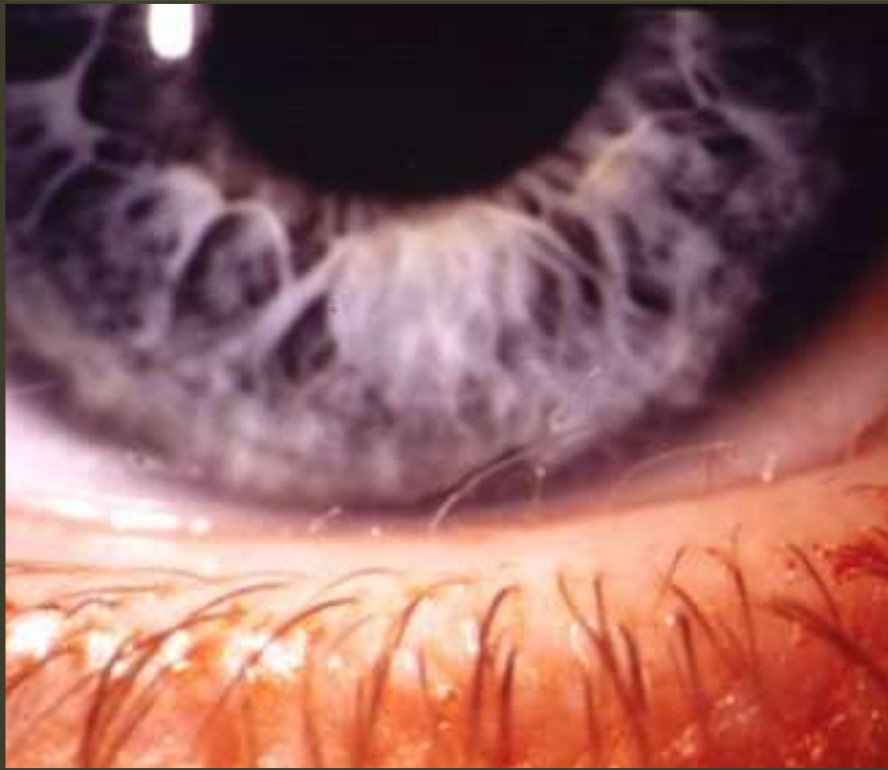
Complications



- Inferior punctate epitheliopathy
- Corneal ulceration and pannus

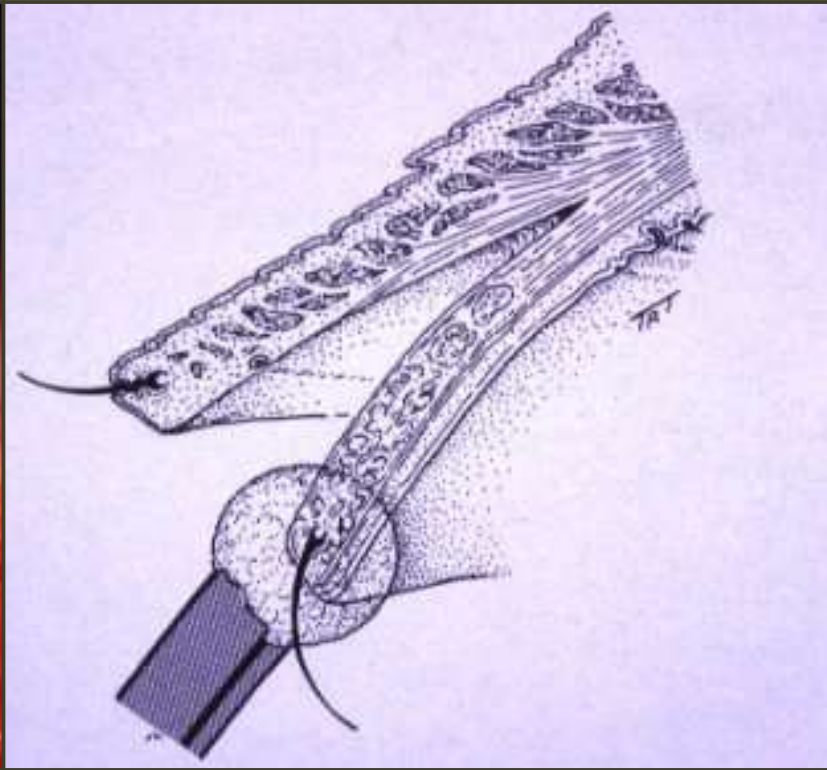
Distichiasis

Signs



- Second row of lashes arising from meibomian gland orifices
- Congenital
- Occasionally dominantly inherited

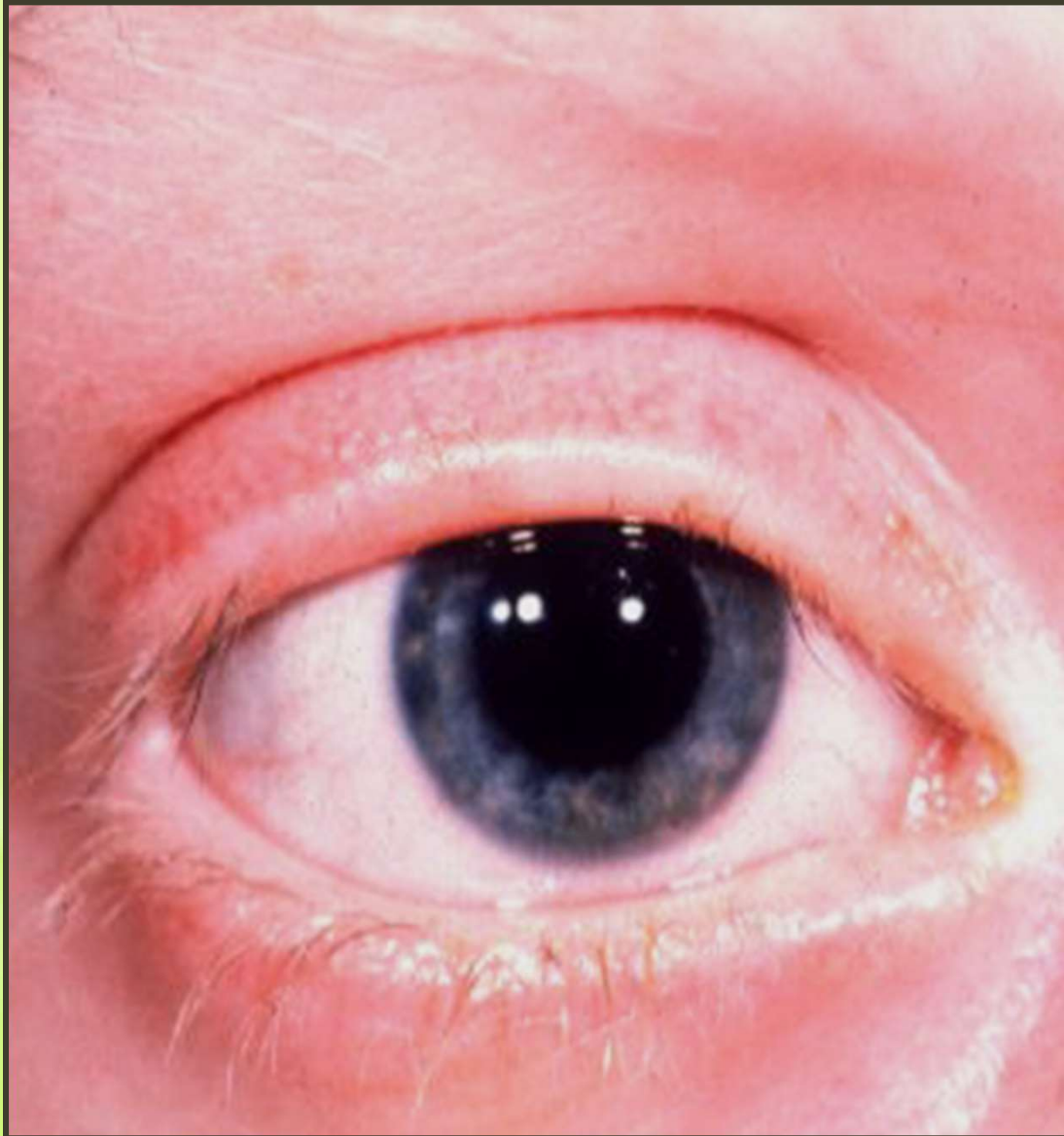
Treatment



- Division into anterior and posterior lamellae
- Cryotherapy to posterior lamella
- Reapposition of lamellae

Madarosis

Decrease in number or complete loss of lashes



Local causes

- Chronic anterior lid margin disease
- Infiltrating tumours
- Burns, radiotherapy or cryotherapy

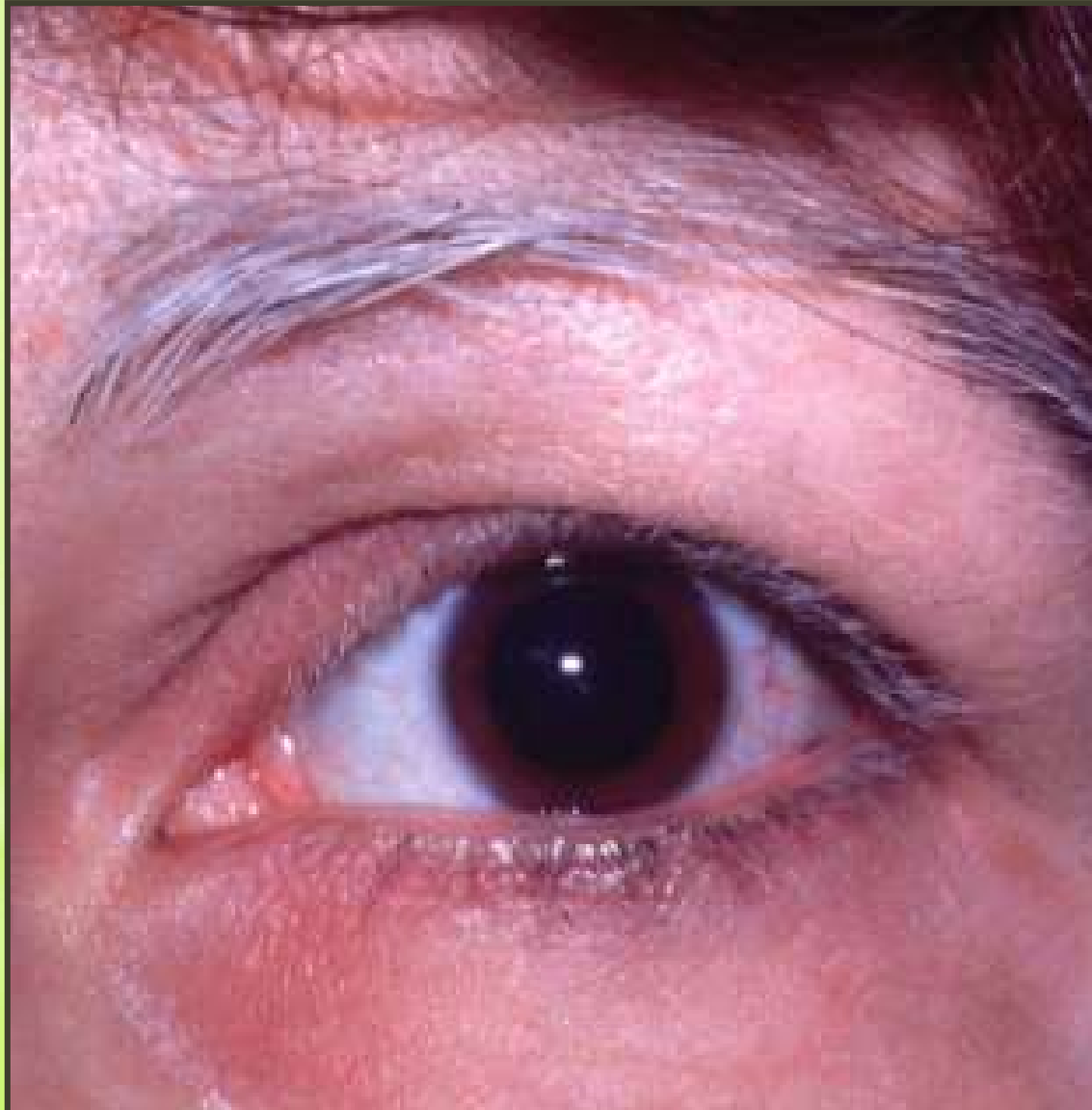
Systemic causes

- Generalized alopecia
- Myxoedema
- SLE
- Syphilis
- Leprosy

Following removal

Poliosis

Premature localized whitening of hair



Ocular associations

- **Chronic anterior blepharitis**
- **Sympathetic ophthalmitis**

Systemic associations

- **Vogt-Koyanagi-Harada syndrome**
- **Waardenburg syndrome**

CHRONIC MARGINAL BLEPHARITIS

1. Anterior

- Staphylococcal
- Seborrhoeic

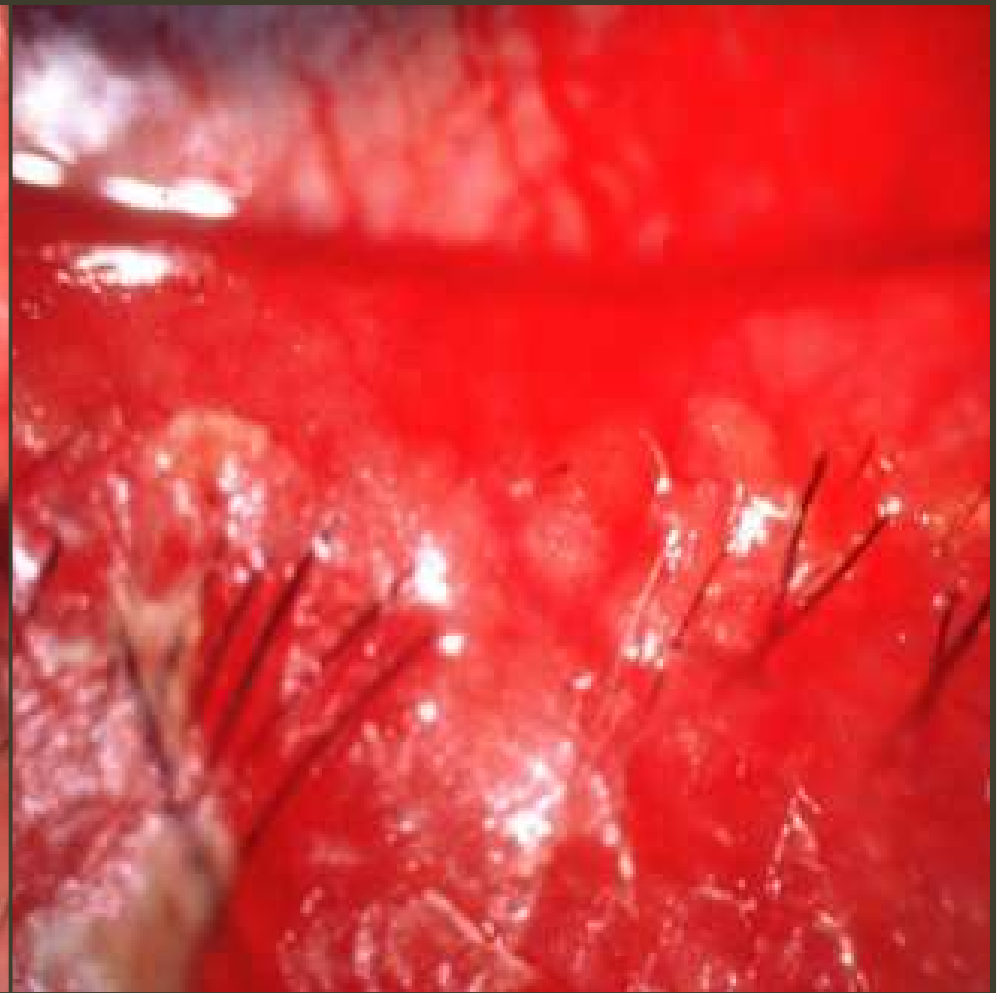
2. Posterior

- Meibomianitis
- Meibomian seborrhoea

Staphylococcal blepharitis



Chronic irritation worse in mornings
Scales around base of lashes
(collarettes)



Hyperaemia and telangiectasia of
anterior lid margin
Scarring and hypertrophy if longstanding

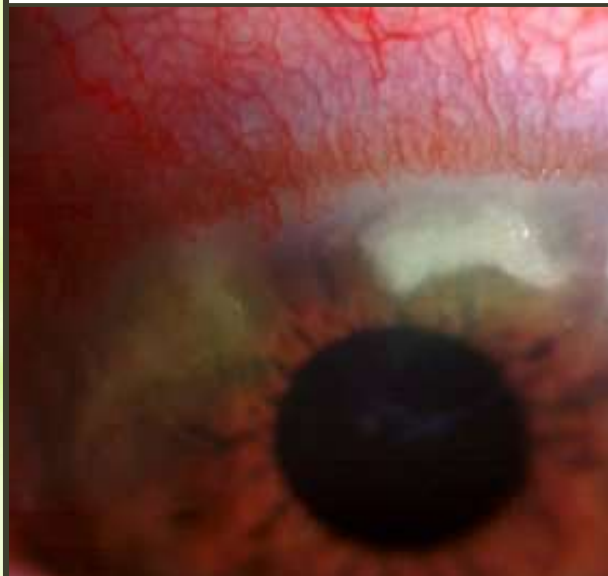
Complications of staphylococcal blepharitis



Madarosi, Poliosis, Trichiasis



Recurrent styes



Marginal keratitis



Tear film instability

Seborrhoeic blepharitis

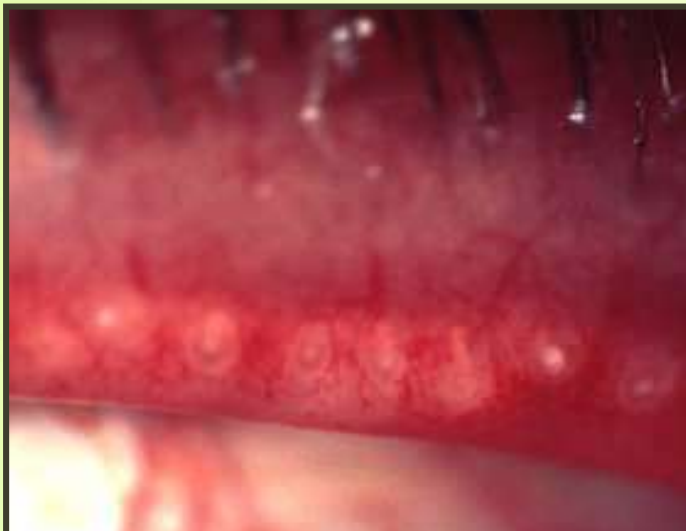


- Shiny anterior lid margin
- Hyperaemia of lid margin

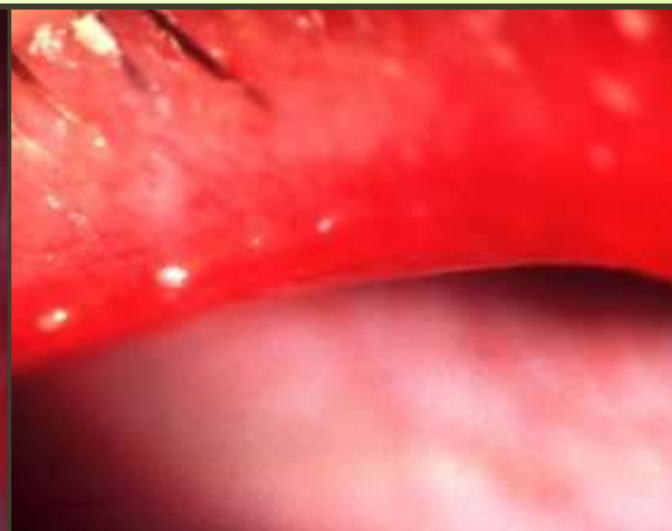


- Greasy scales
- Lashes stuck together

Meibomianitis



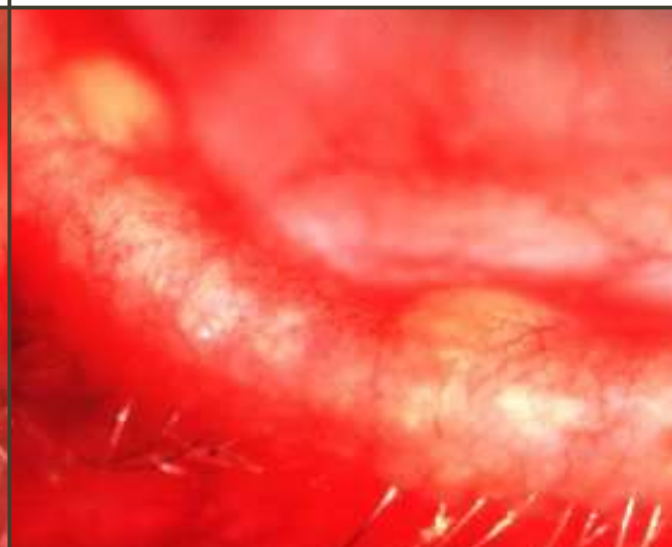
**Inflamed and blocked
meibomian gland orifices**



**Toothpaste-like plaques
from meibomian glands**



Thickened posterior lid margin



Meibomian cyst formation

DIFFUSE EYELID DISEASE

1. Allergic

- Acute oedema
- Contact dermatitis
- Atopic dermatitis
- Blepharochalasis

2. Infections

- Preseptal cellulitis
- Herpes simplex
- Herpes zoster ophthalmicus
- Impetigo
- Erysipelas
- Necrotizing fasciitis

3. Miscellaneous

- Fat herniation
- Systemic causes

Acute allergic oedema



- **Causes - insect bites, urticaria and angioedema**
- **Unilateral or bilateral**
- **Painless, red, pitting oedema**
- **Chemosis may be present**
- **Self-limiting**

Contact dermatitis



- **Sensitivity to topical medication**
- **Unilateral or bilateral**
- **Painless oedema and erythema**
- **Vesiculation and crusting**
- **Thickening if chronic**

Atopic dermatitis

Associated with asthma and hay fever

- **Chronic itching and scratching**



Facial - in young children



Flexural - knees, elbows, wrists and ankles

Preseptal cellulitis



Causes

- Skin trauma or insect bites of lids or eyebrows
- Spread from local infection
- Upper respiratory or ear infection

Signs

- Usually unilateral
- Tender and red
- Periorbital oedema

Treatment –
systemic antibiotics

Herpes simplex



Signs

- Crops of small vesicles
- Rupture and crust
- Heal without scarring after 7 days

Complications

- Follicular conjunctivitis
- Keratitis

Treatment –
Topical antivirals

Herpes zoster ophthalmicus



- Painful vesicles and pustules
- Periorbital oedema - may be bilateral



- Crusting ulceration
- Treatment** - oral antivirals

Systemic causes of lid oedema



- **Myxoedema**
- **Renal disease**
- **Congestive heart failure**
- **Obstruction of superior vena cava**
- **Fabry disease**

BENIGN EYELID LESIONS

1. Nodules

- Chalazion
- Acute hordeola
- Molluscum contagiosum
- Xanthelasma

2. Cysts

- Cyst of Moll
- Cyst of Zeiss
- Sebaceous cyst
- Hidrocystoma

3. Tumours

- Viral wart
- Keratoacanthoma
- Naevi
 - Capillary haemangioma
- Port-wine stain
- Pyogenic granuloma
- Cutaneous horn

Chalazion (Meibomian cyst)



**Painless, roundish, firm lesion
within tarsal plate**



**May rupture through conjunctiva
and cause granuloma**

Xanthelasma



- **Common in elderly or those with hypercholesterolaemia**
- **Yellowish, subcutaneous plaques containing cholesterol and lipid**
- **Usually bilateral and located medially**

Eyelid cysts

Cyst of Moll



- Translucent
- On anterior lid margin

Eccrine sweat gland hidrocystoma



- Similar to cyst of Moll
- Not confined to lid margin

Cyst of Zeis



- Opaque
- On anterior lid margin

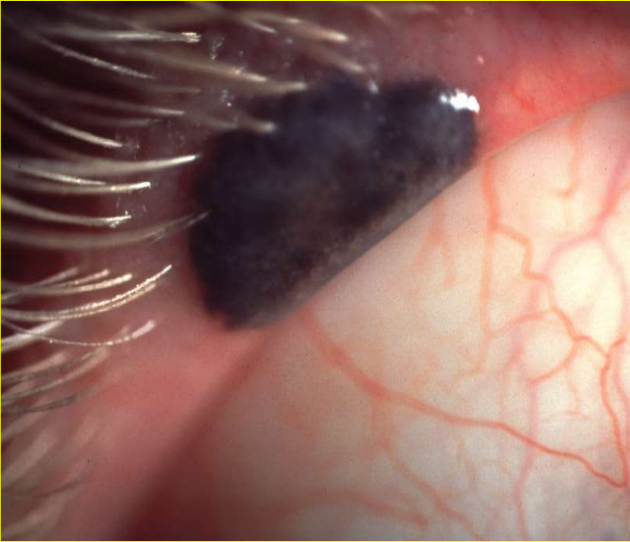
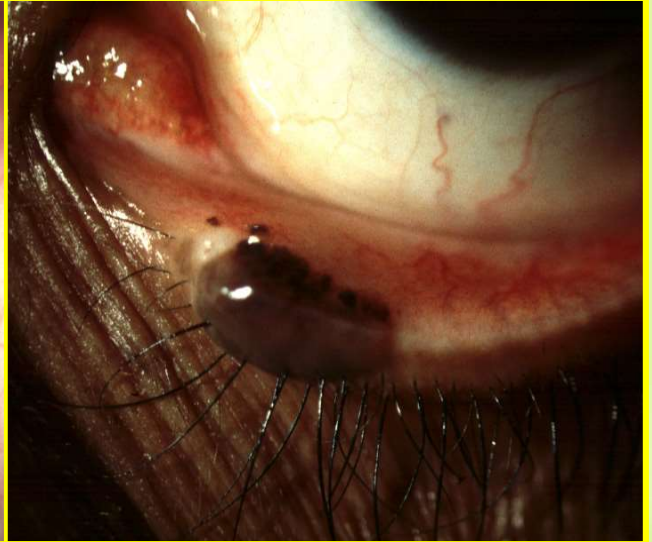
Sebaceous cyst



- Cheesy contents
- Frequently at inner canthus

Naevi

- Appearance and classification determined by location within skin
- Tend to become more pigmented at puberty

Intradermal	Junctional	Compound
		
• Elevated • May be non-pigmented • No malignant potential	• Flat, well-circumscribed • Pigmented • Low malignant potential	• Has both intradermal and junctional components

MALIGNANT EYELID TUMOURS

- 1. Basal cell carcinoma**
- 2. Squamous cell carcinoma**
- 3. Meibomian gland carcinoma**
- 4. Melanoma**
- 5. Kaposi sarcoma**

Frequency of location of basal cell carcinoma



Lower lid - 70%



Medial canthus - 15%



Upper lid - 10%



Lateral canthus - 5%

Squamous cell carcinoma

- Less common but more aggressive than BCC
- May arise *de novo* or from actinic keratosis
- Predilection for lower lid

Nodular



- Hard, hyperkeratotic nodule
- No surface vascularization
- May develop crusting fissures

Ulcerative



- Red base
- Borders sharply defined, indurated and elevated

ECTROPION AND ENTROPION

1. Ectropion

- **Involutional**
- **Cicatricial**
- **Paralytic**
- **Mechanical**

2. Entropion

- **Involutional**
- **Cicatricial**
- **Congenital**
- **Epiblepharon**

Involutorial Ectropion



- **Affects lower lid of elderly patients**
- **May cause chronic conjunctival inflammation and thickening**

Paralytic Ectropion

Caused by facial nerve palsy which, if severe, may give rise to the following:



Exposure keratopathy caused by lagophthalmos



Epiphora caused by combination of:

- **Failure of lacrimal pump mechanism**
- **Increase in tear production resulting from corneal exposure**

Involucional Entropion

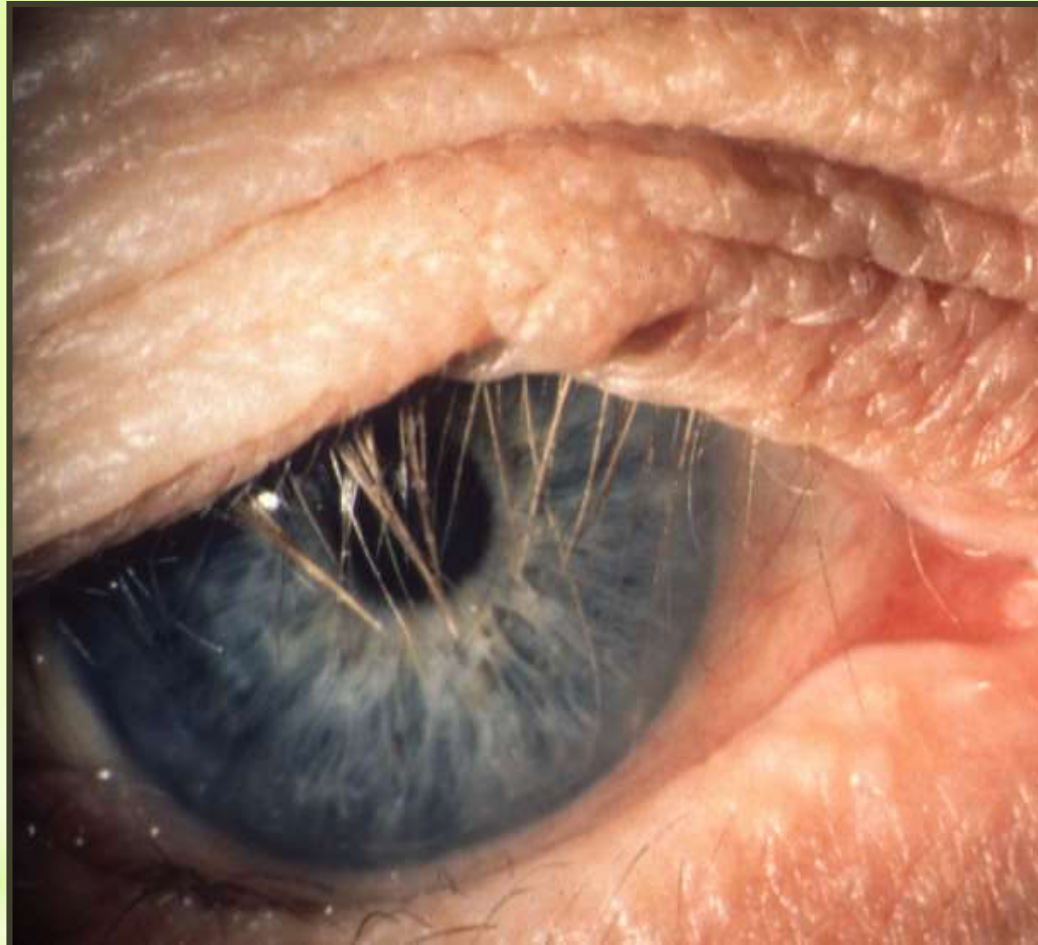


Affects lower lid because upper lid has wider tarsus and is more stable



If longstanding may result in corneal ulceration

Cicatricial Entropion



- **Severe scarring of palpebral conjunctiva which pulls lid margin towards globe**
- **May affect lower or upper eyelid**
- **Causes include cicatrizing conjunctivitis, trachoma and chemical burns**

CLASSIFICATION OF PTOSIS

1. Neurogenic

- Third nerve palsy
- Third nerve misdirection
- Horner syndrome
- Marcus Gunn jaw-winking syndrome

2. Myogenic

- Myasthenia gravis
- Myotonic dystrophy
- Ocular myopathies
- Simple congenital
- Blepharophimosis syndrome

3. Aponeurotic

4. Mechanical

Left third nerve palsy



Severe unilateral ptosis and defective adduction



Normal abduction



Defective elevation



Defective depression

Horner syndrome



- **Caused by oculosympathetic palsy**
- **Usually unilateral mild ptosis and miosis**
- **Normal pupillary reactions**
- **Slight elevation of lower lid**
- **Iris hypochromia if congenital or longstanding**
- **Anhydrosis if lesion is below superior cervical ganglion**

Aponeurotic Ptosis

- Weakness of levator aponeurosis
- Causes - involutional, postoperative and blepharochalasis

Mild



High upper lid crease



Good levator function

Severe



Absent upper lid crease



Deep sulcus

Mechanical Ptosis

Causes



Dermatochalasis



Large tumours



Severe lid oedema



Anterior orbital lesions

Lacrimal System and ORBIT

Prof. Mahfouth A Bamashmus
FRCSEd, FRCOphth

INFECTIONS OF LACRIMAL PASSAGES

1. Congenital nasolacrimal duct obstruction

2. Dacryocystitis

- Acute
- Chronic

Congenital nasolacrimal duct obstruction

Caused by delayed canalization near valve of Hasner•
On pressure reflux of purulent material from punctum•



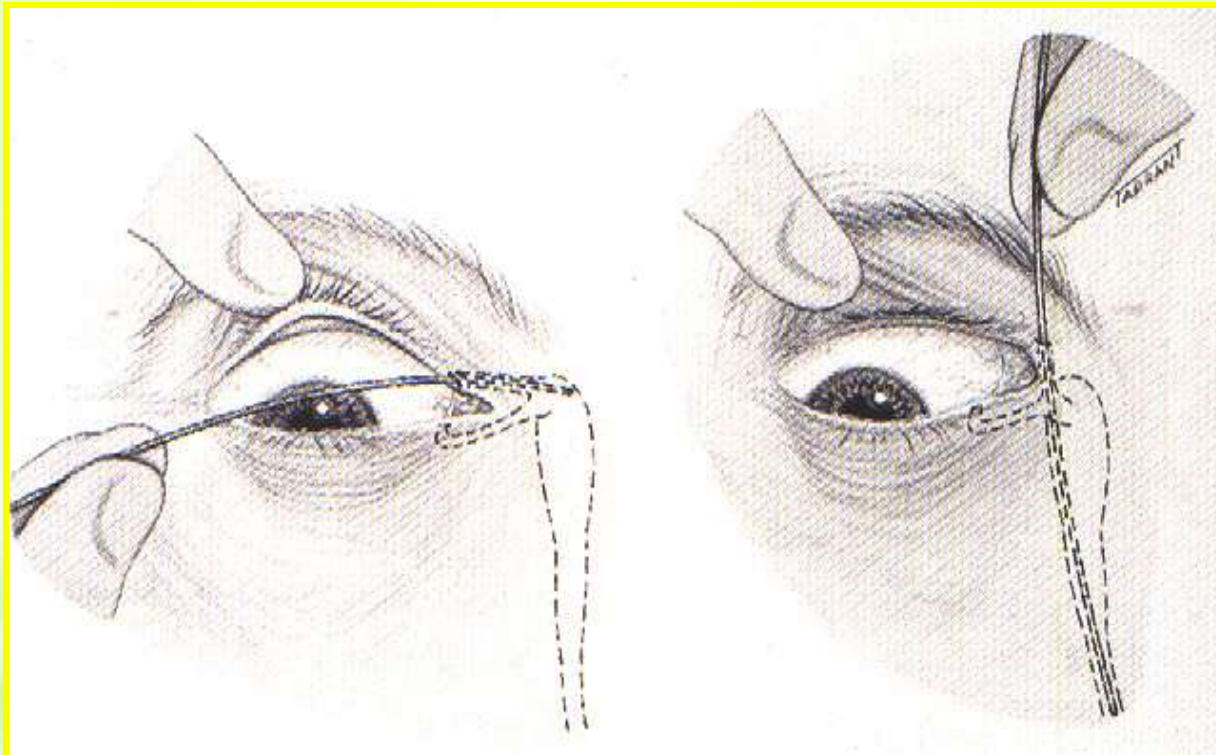
Epiphora and matting



Infrequently acute dacryocystitis

Treatment of congenital nasolacrimal duct obstruction

- Massage of nasolacrimal duct and antibiotic drops 4 times daily
- Improvement by age 12 months in 95% of cases



- If no improvement - probe at 12-18 months
- Results - 90% cure by first probing and 6% by second

Acute dacryocystitis

Usually secondary to nasolacrimal duct obstruction



- Tender canthal swelling
- Mild preseptal cellulitis



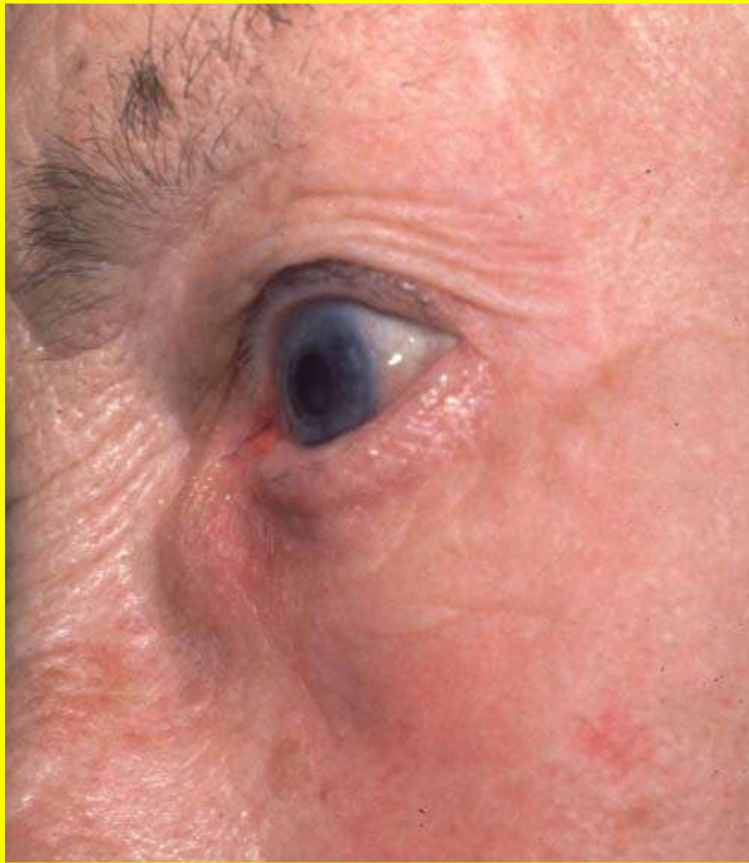
- May develop into abscess

Treatment

- Systemic antibiotics and warm compresses
- DCR after acute infection is controlled

Chronic dacryocystitis

Epiphora and chronic or recurrent unilateral conjunctivitis



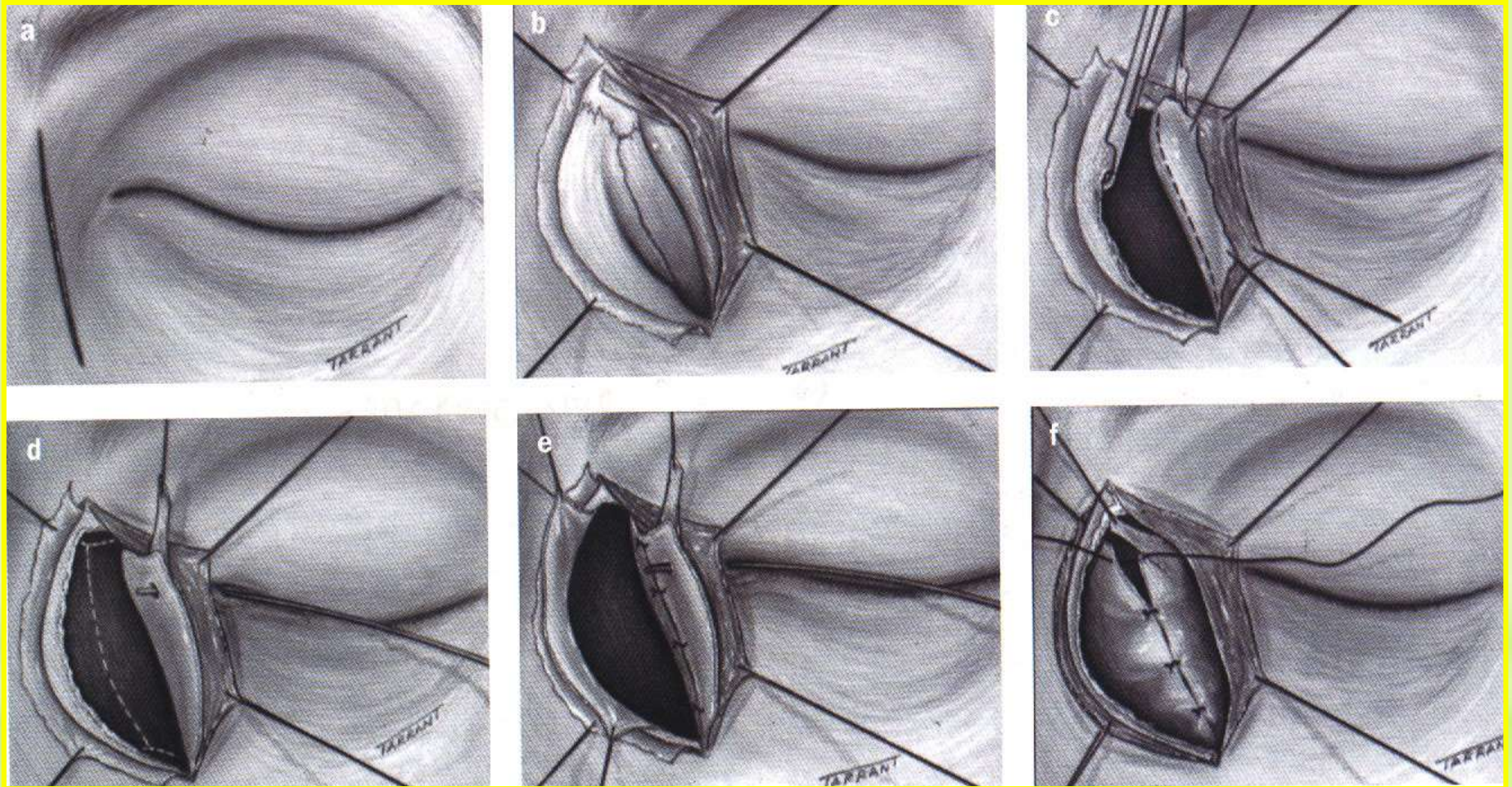
Painless swelling at inner canthus



Expressed mucopurulent material

Treatment - DCR

Dacryo-cysto-rhinostomy (DCR)



Orbital cellulitis

- **Infection behind orbital septum**
- **Usually secondary to ethmoiditis**
- **Presentation - severe malaise, fever and orbital signs**

Signs



- **Severe eyelid oedema and redness**
- **Proptosis - most frequently lateral and down**
- **Painful ophthalmoplegia**
- **Optic nerve dysfunction if advanced**

Management of orbital cellulitis



Pre-treatment



Post-treatment

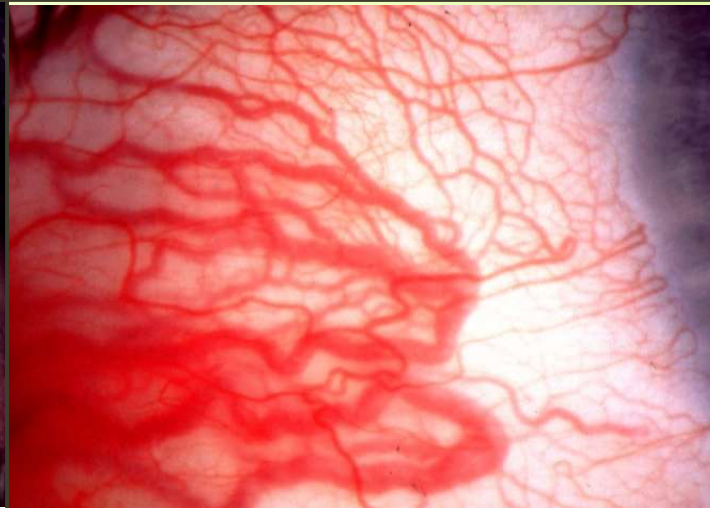
- 1. Hospital admission**
- 2. Systemic antibiotic therapy**
- 3. Monitoring of optic nerve function**
- 4. Indications for surgery**
 - Resistance to antibiotics
 - Orbital or subperiosteal abscess
 - Optic neuropathy

Thyroid Ophthalmopathy

Periorbital and lid swelling



Conjunctival hyperaemia



Chemosis



Superior limbic keratoconjunctivitis



Signs of eyelid retraction

Occurs in about 50%



- **Bilateral lid retraction**
- **No associated proptosis**



- **Bilateral lid retraction**
- **Bilateral proptosis**



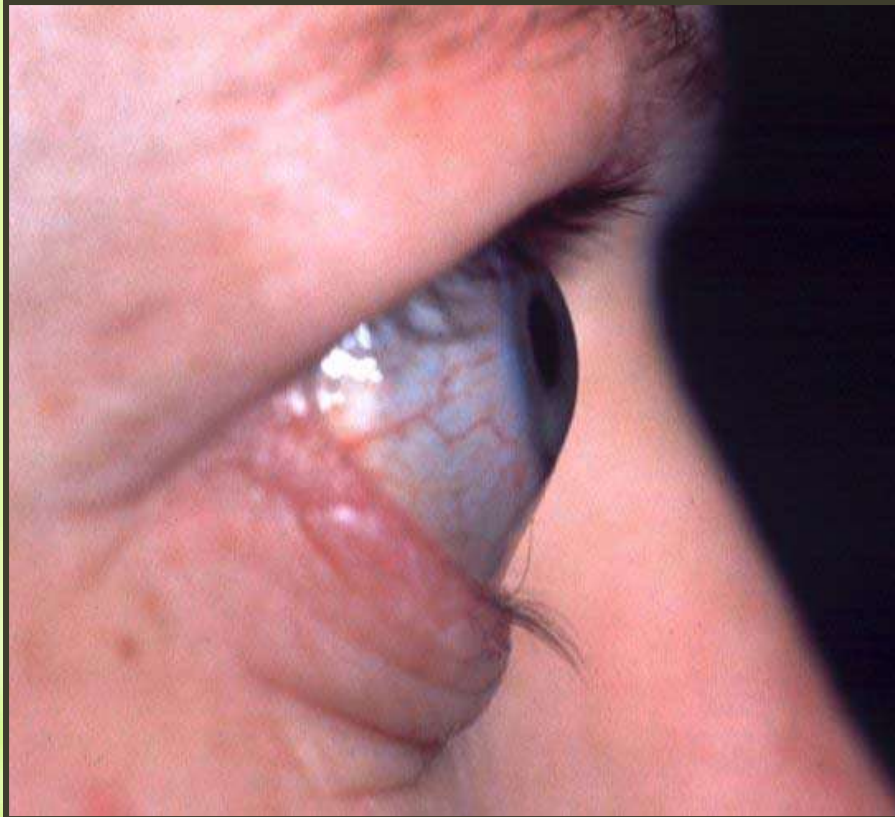
- **Unilateral lid retraction**
- **Unilateral proptosis**



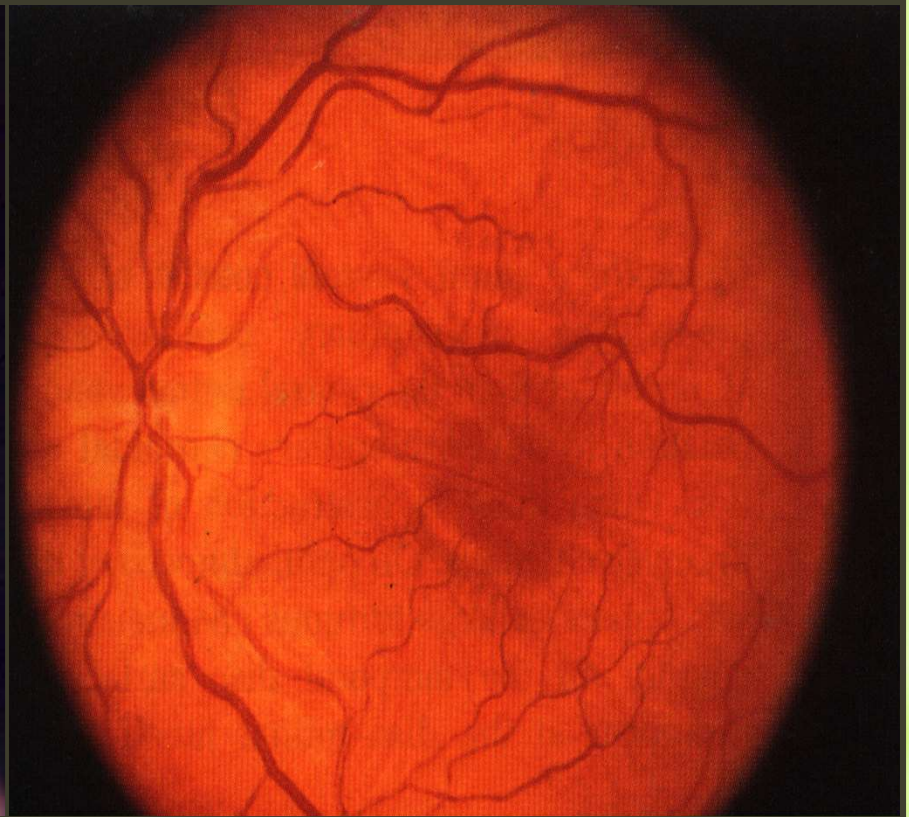
- **Lid lag in downgaze**

Proptosis

- Occurs in about 50%
- Uninfluenced by treatment of hyperthyroidism



Axial and permanent in about 70%



May be associated with choroidal folds

Treatment options

- Systemic steroids
- Radiotherapy
- Surgical decompression

Superficial dermoid cyst

- **Presents in infancy**
- **No displacement of globe**



- **Most commonly superotemporal**
- **Freely mobile under skin**



- **Occasionally superonasal**
- **Posterior margins are easily palpable**

Uveal Tract

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Uveal Tract

- * Is the intermediate coat of the eyeball

- * Consists of :

Iris

Ciliary Body

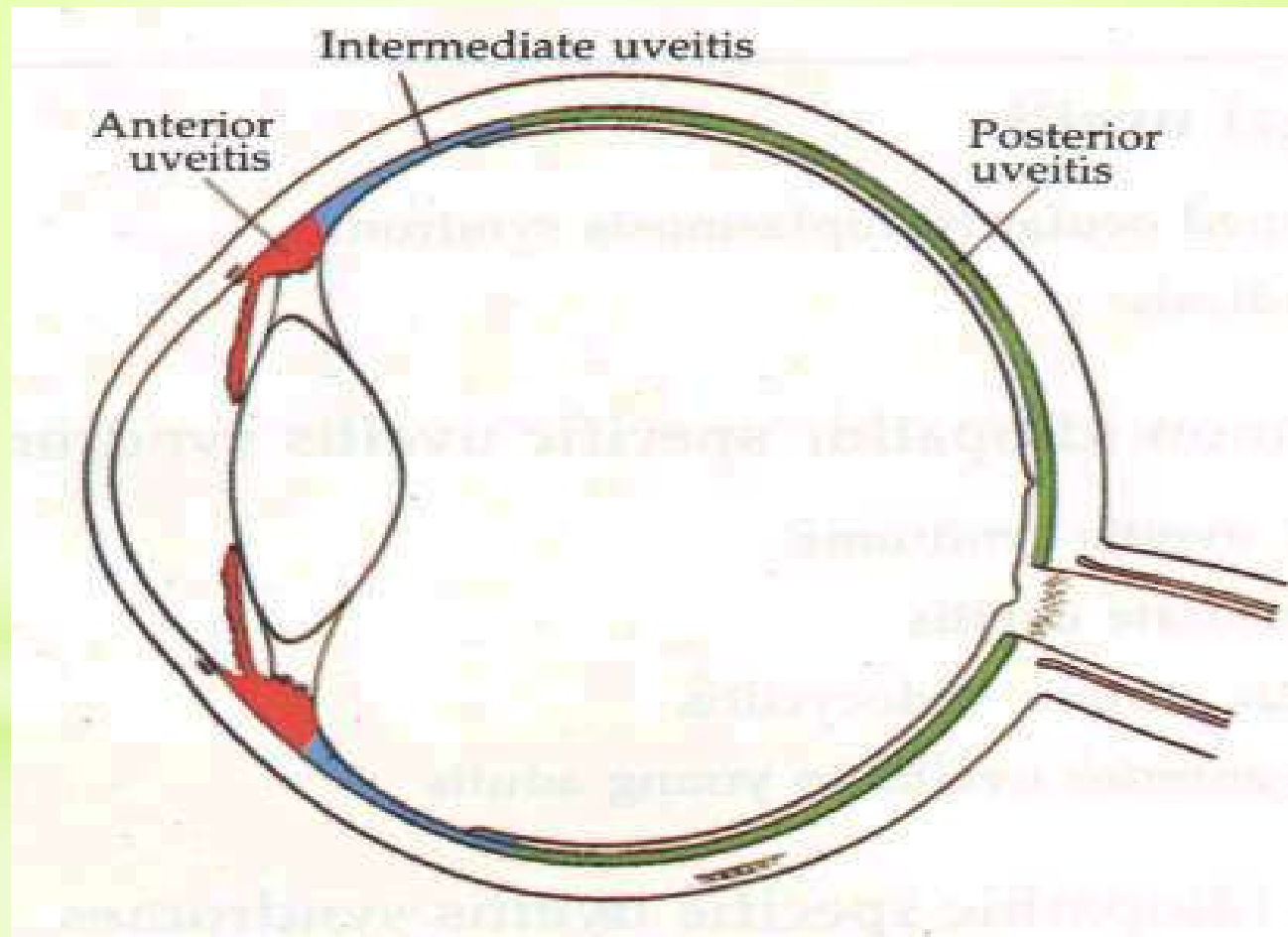
Choroid

Anterior Uvea

Posterior Uvea



Anatomical classification of uveitis



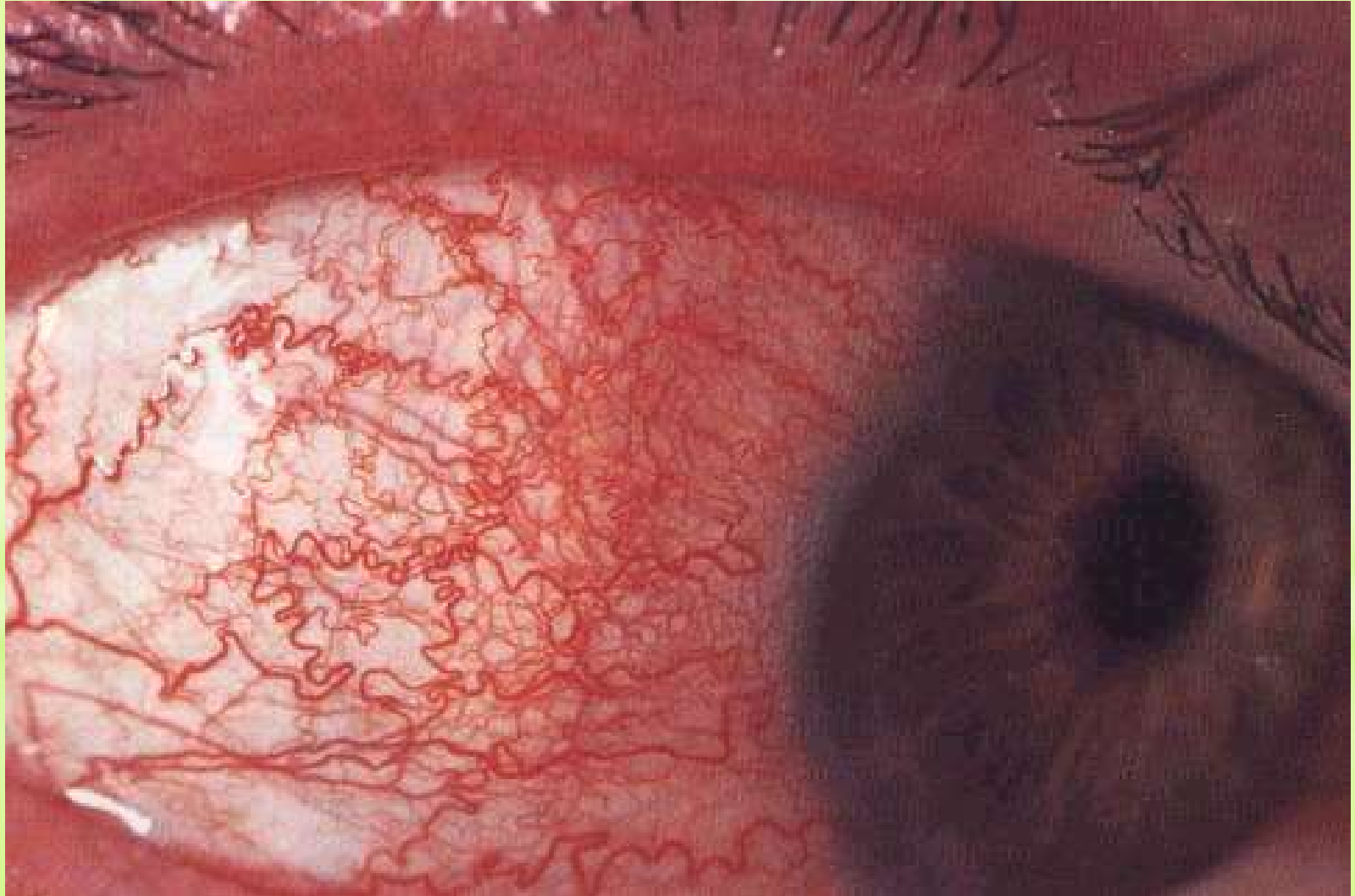
Symptoms

- * Pain
- * Photophobia
- * Lacrimation
- * Decreased vision
 - * Haziness of Aqueous and vitreous
 - * Oedema of cornea
 - * Spasm of CB - Myopia
 - * Macular Oedema
 - * Secondary Glaucoma

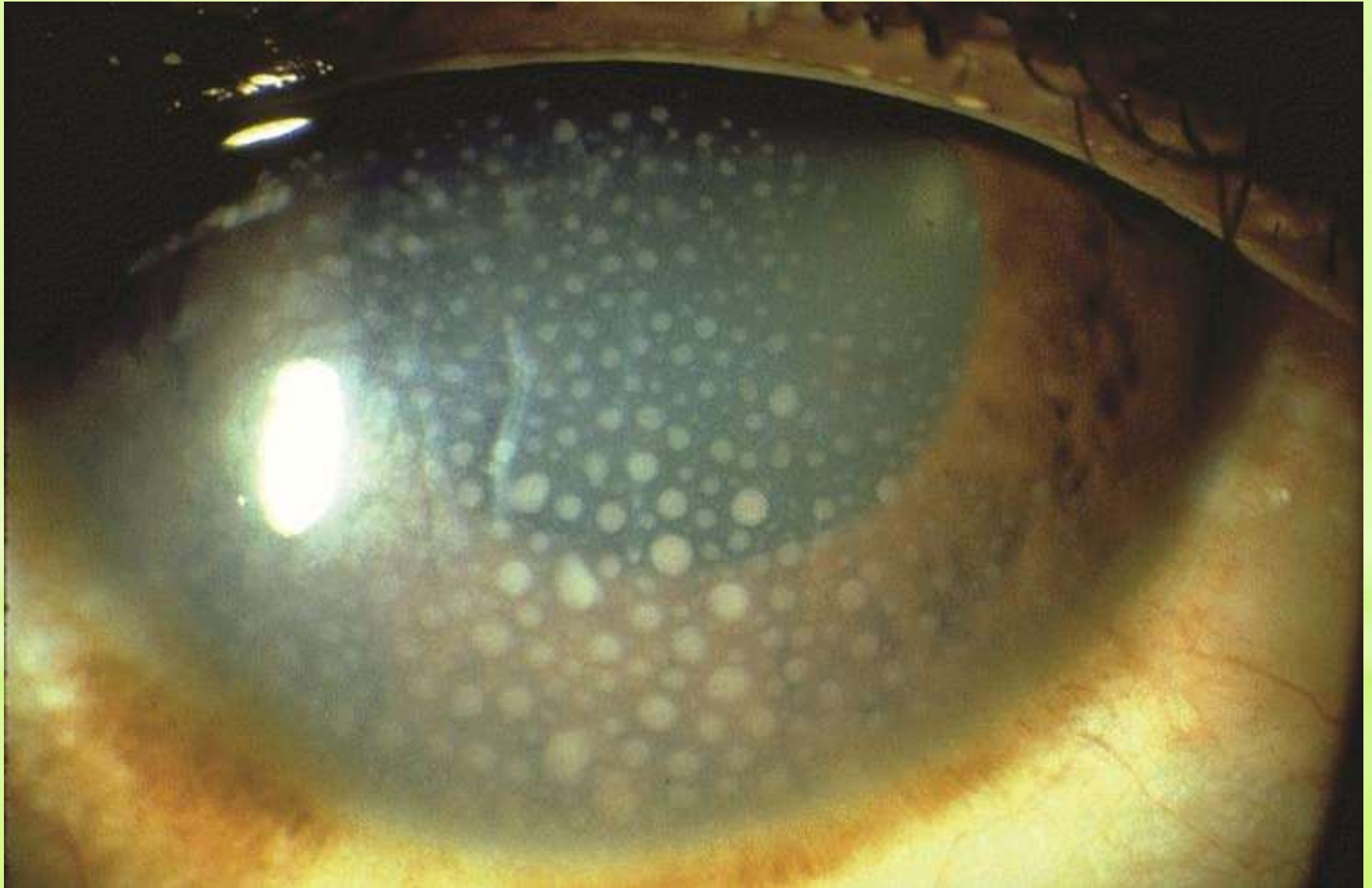
Signs

*Lids	<i>Edematous</i>	
*Conjunctiva	<i>Ciliary injection</i>	
*Cornea	<i>KPs</i>	
*AC	<i>Aqueous Flare</i>	<i>Aqueous Cells</i>
	<i>Hypopyon</i>	<i>Hyphaema</i>
*Iris changes	<i>Muddy</i>	
*Pupil	<i>Constricted and irregular;</i>	
<i>Synechia</i>		
*Ciliary Body	<i>Spasm</i>	
*Vitreous	<i>Cloudy</i>	
*The tension	<i>Secondary Glaucoma</i>	

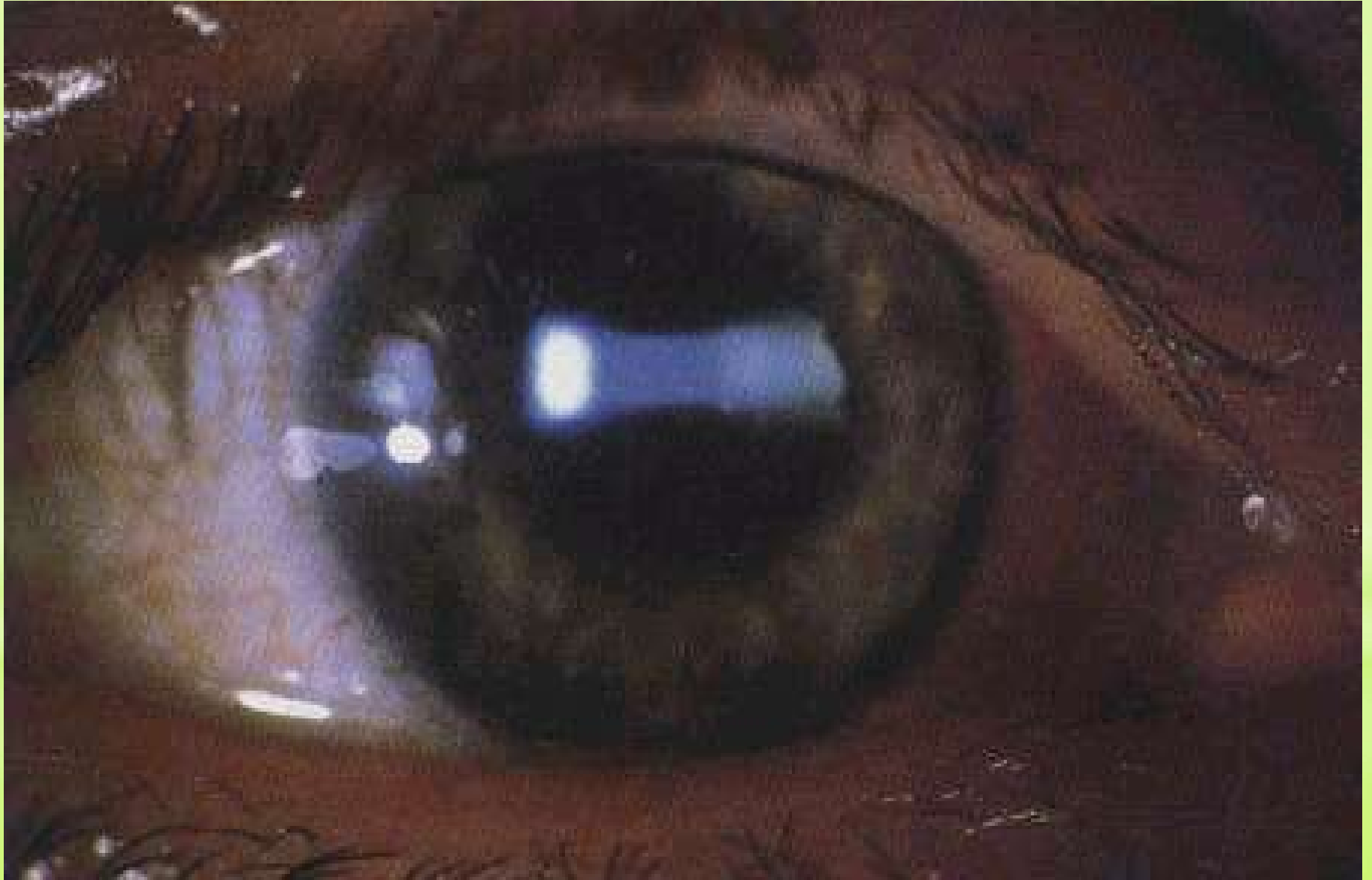
Ciliary injection in acute anterior uveitis



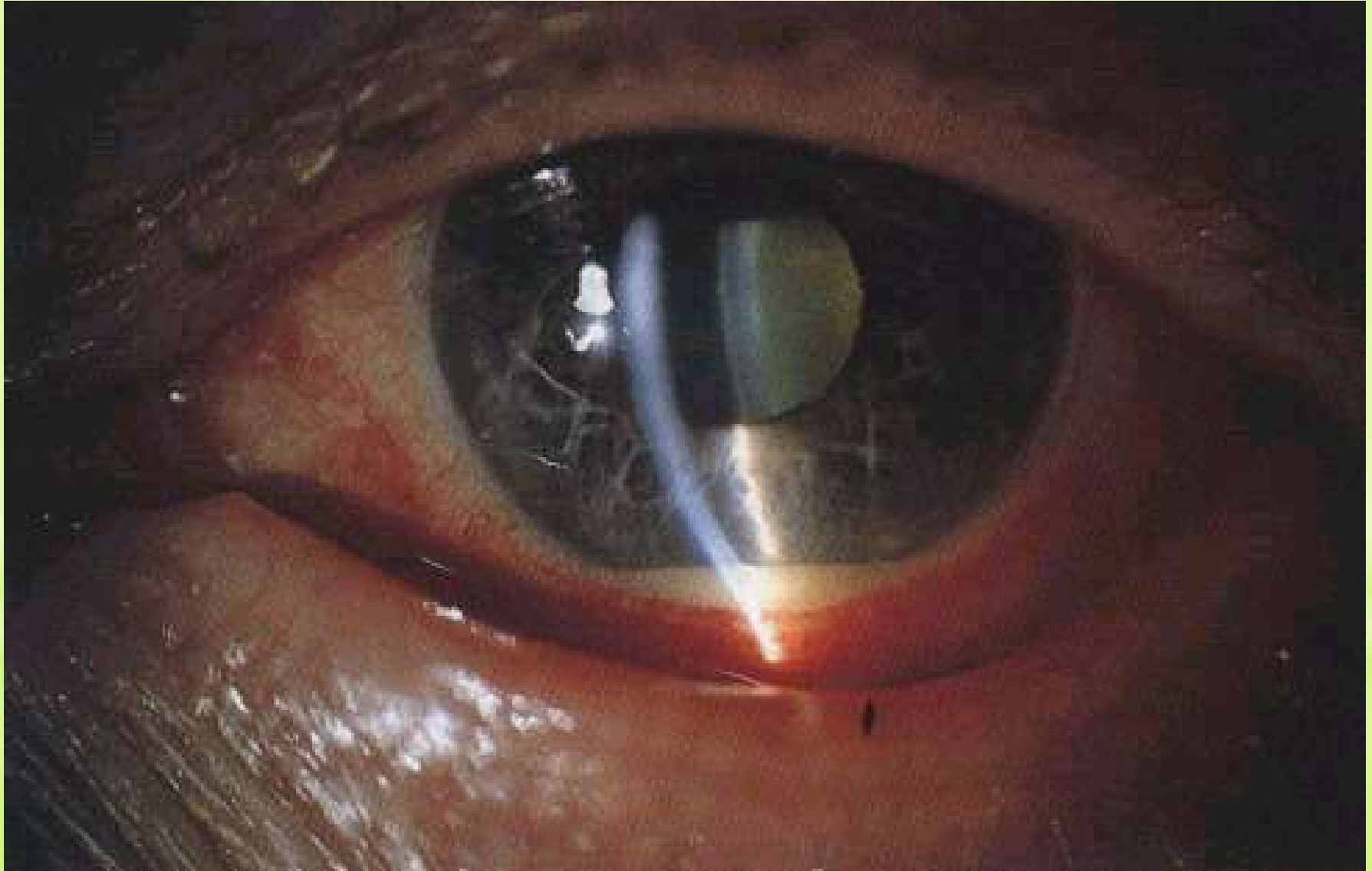
Keratic Precipitates (KPs)



Aqueous cells and dense flare



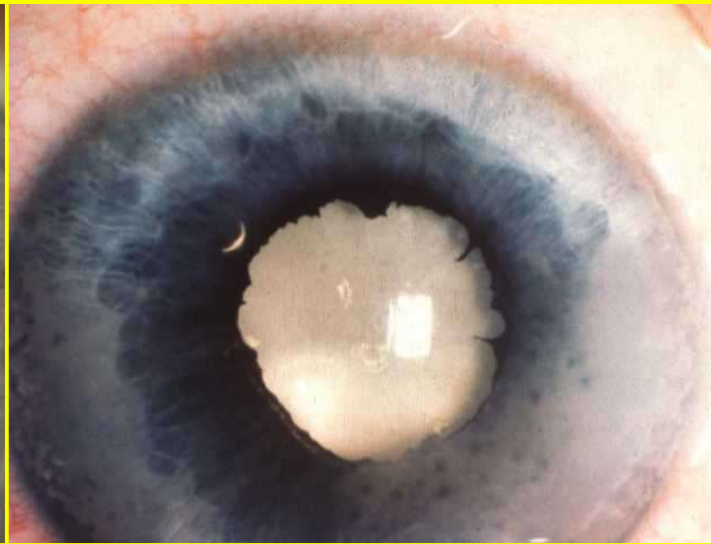
Hypopyon in Anterior Uveitis



Complications of Anterior Uveitis



Posterior synechiae - 30%



Cataract -20%

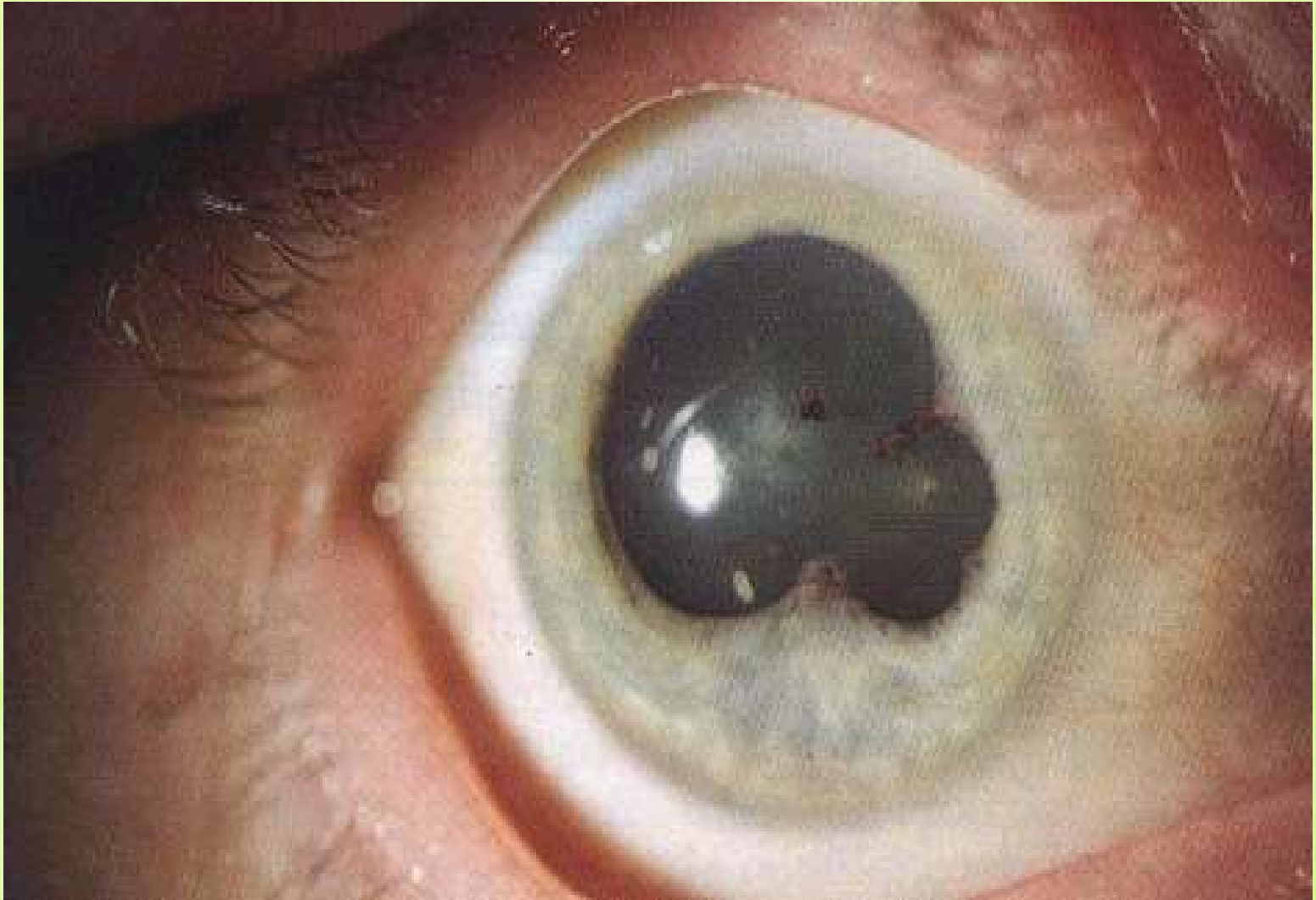


Glaucoma due to PAS - 15%

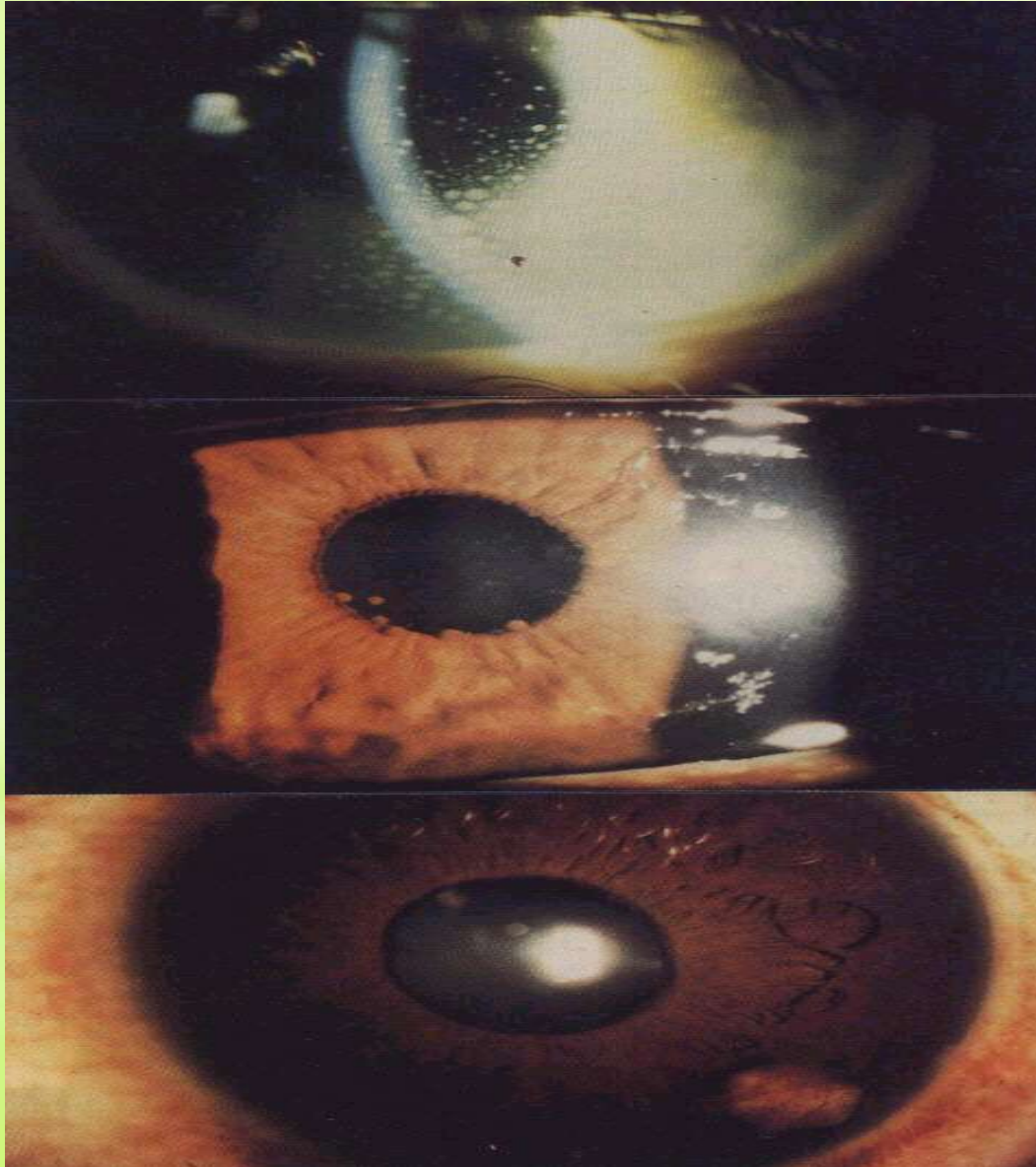


Band keratopathy - 10%

***Posterior Synechiae following attack
of acute anterior uveitis***



Granulomatous anterior uveitis

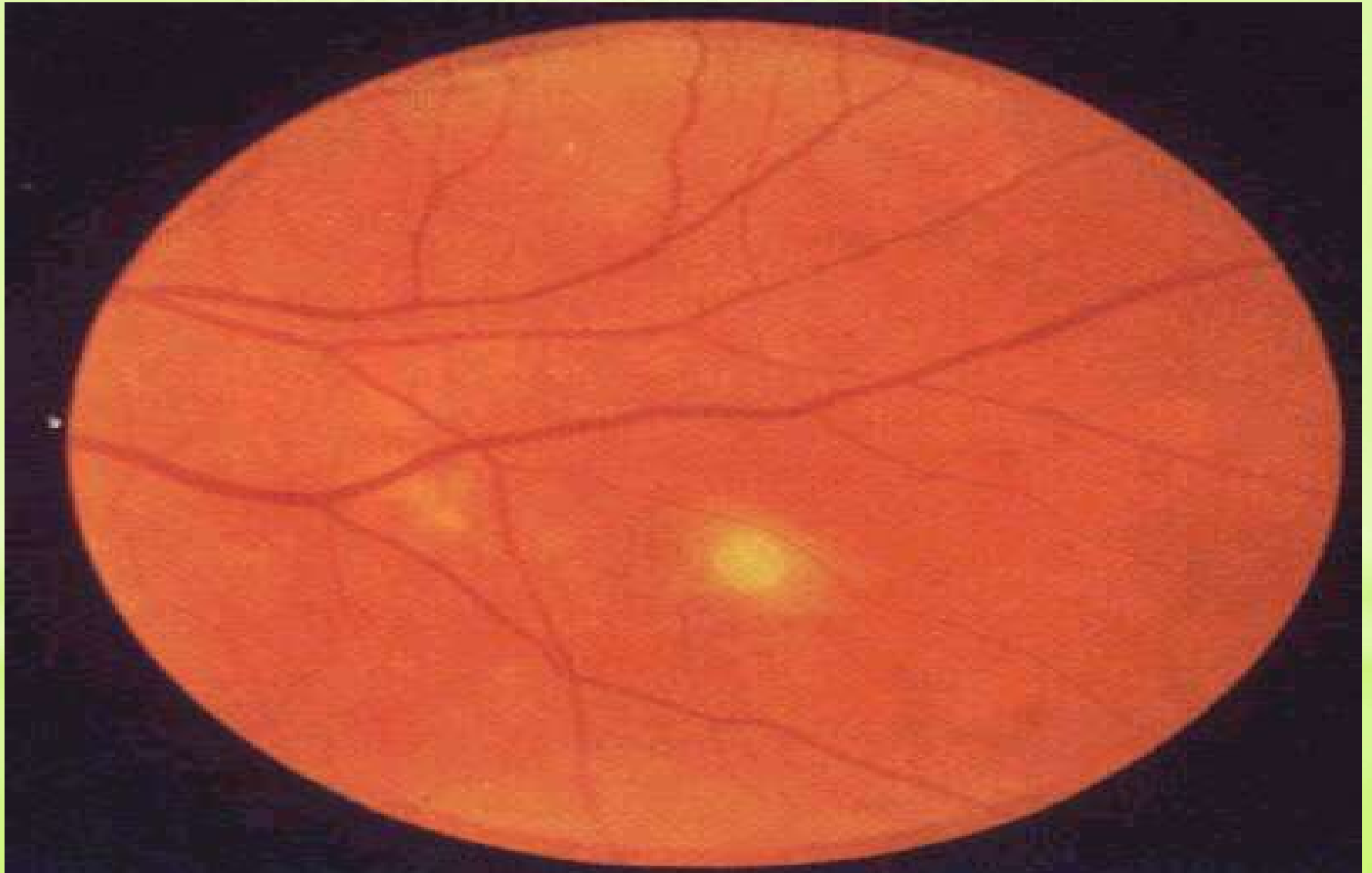


Mutton Fat KPs

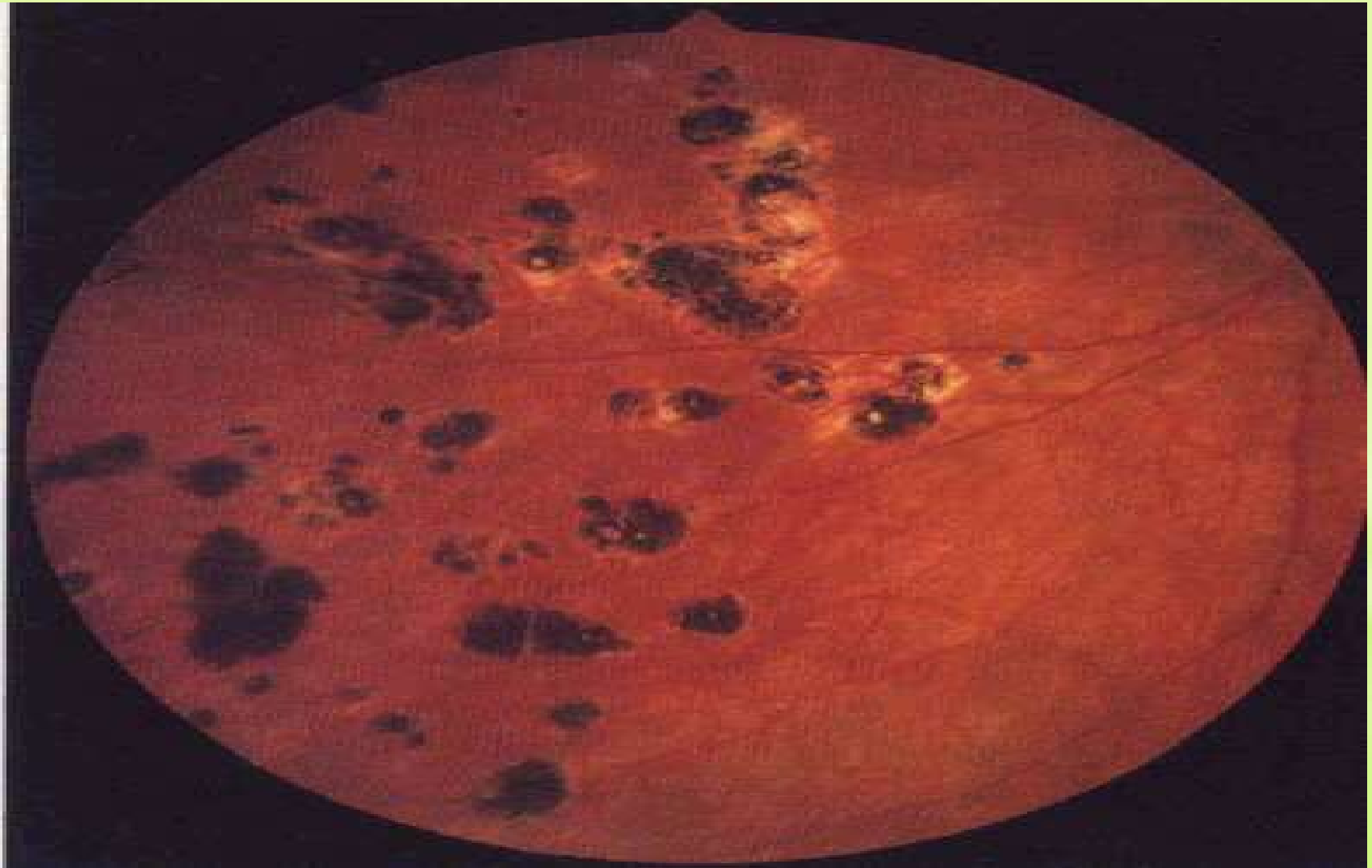
Koeppe nodules

Busacca nodule

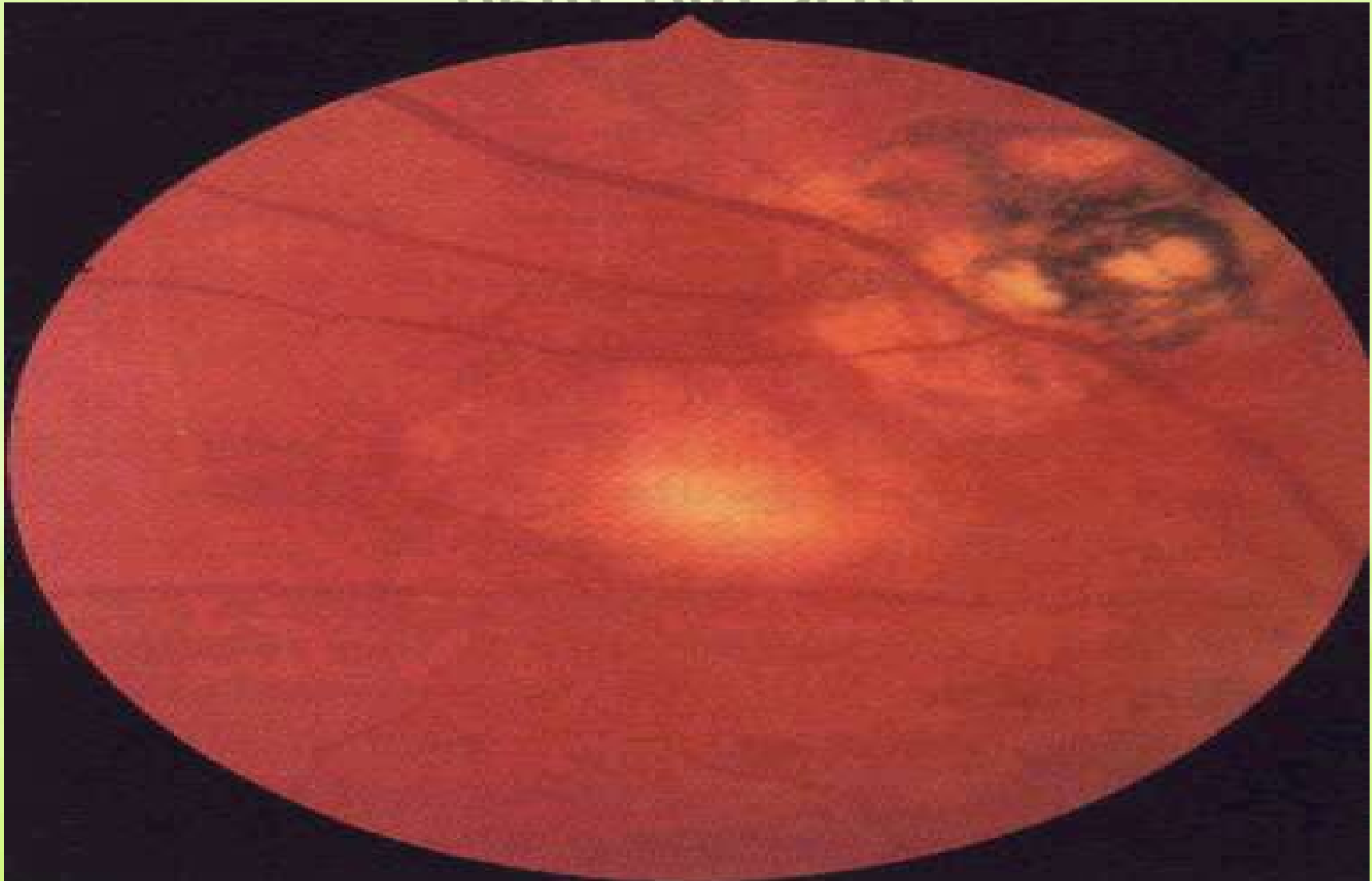
Active focal Choroiditis



Old multifocal choroiditis



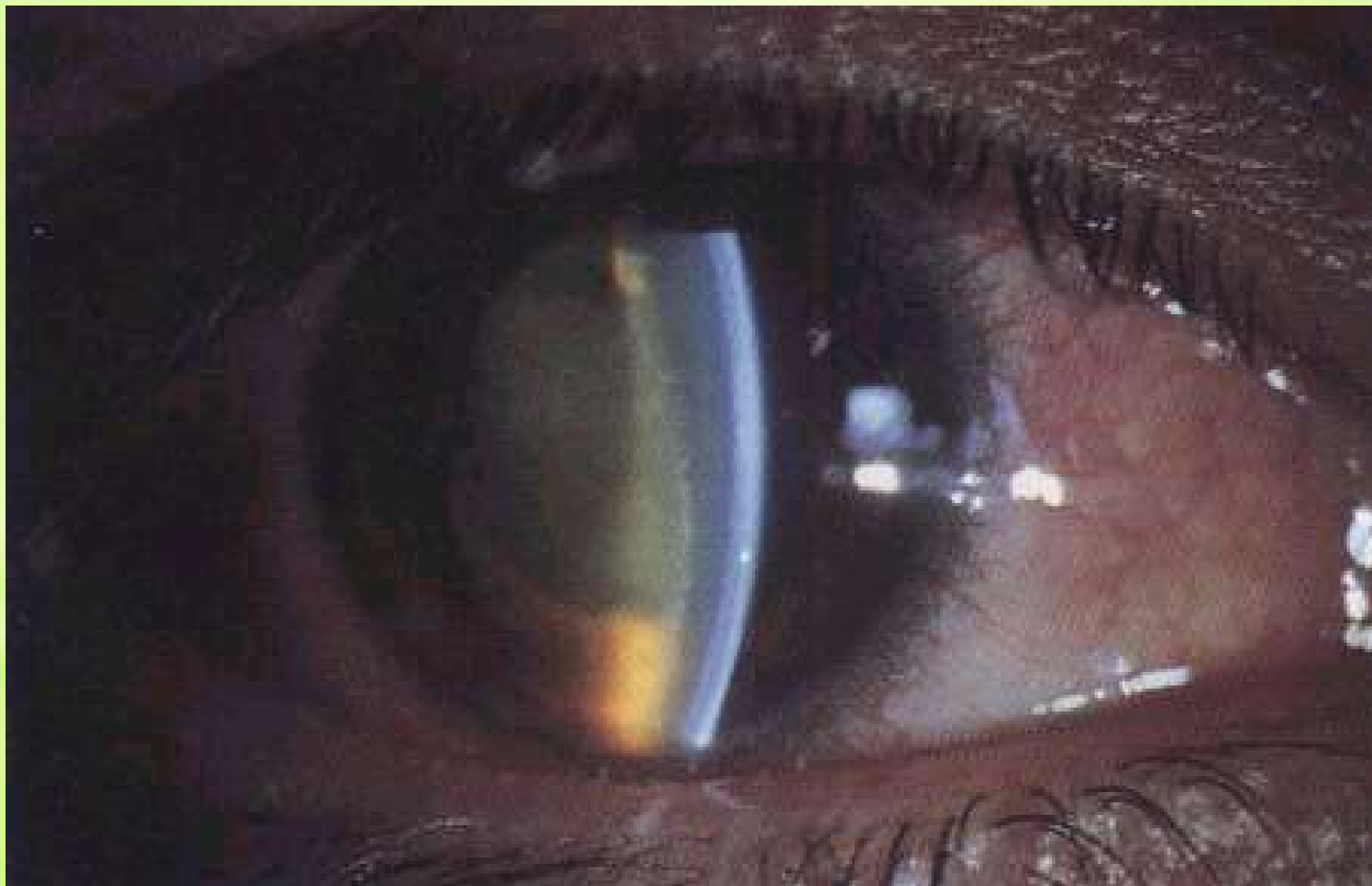
***Active focal toxoplasma retinitis
near old scar***



Advanced Ankylosing Spondylitis. *Left:* (fixed flexion deformity; radiographic changes showing bilateral sclerosis and erosion of sacroiliac joints and bony fusion of spine



Very severe acute anterior uveitis with fibrinous aqueous exudate in ankylosing spondylitis

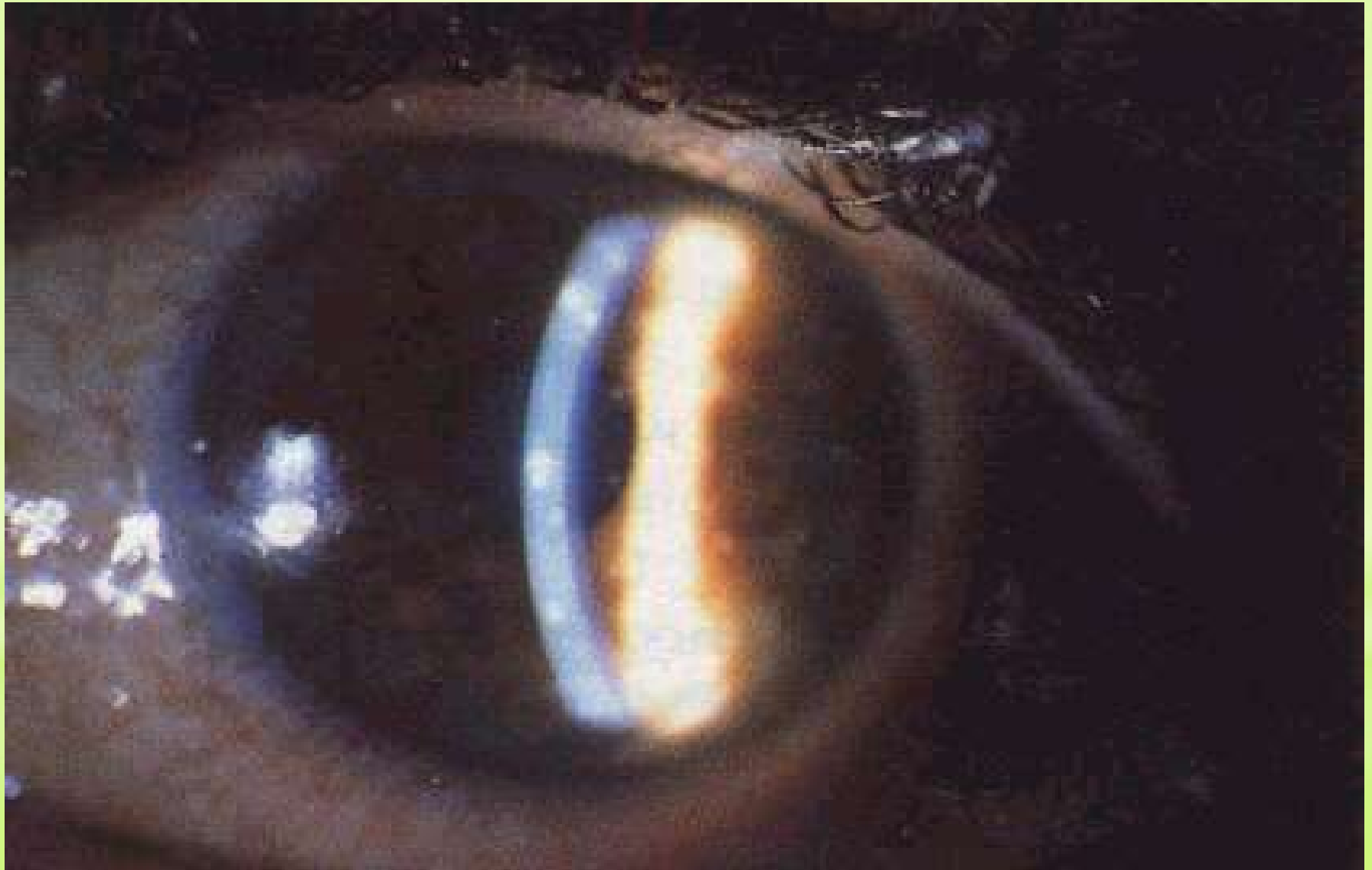


Reiter's disease

*(acute arthritis of ankles; radiograph showing calcaneal spur;
keratoderma blenorrhagica; circinate balanitis)*



Subepithelial corneal opacities in Reiter's keratitis



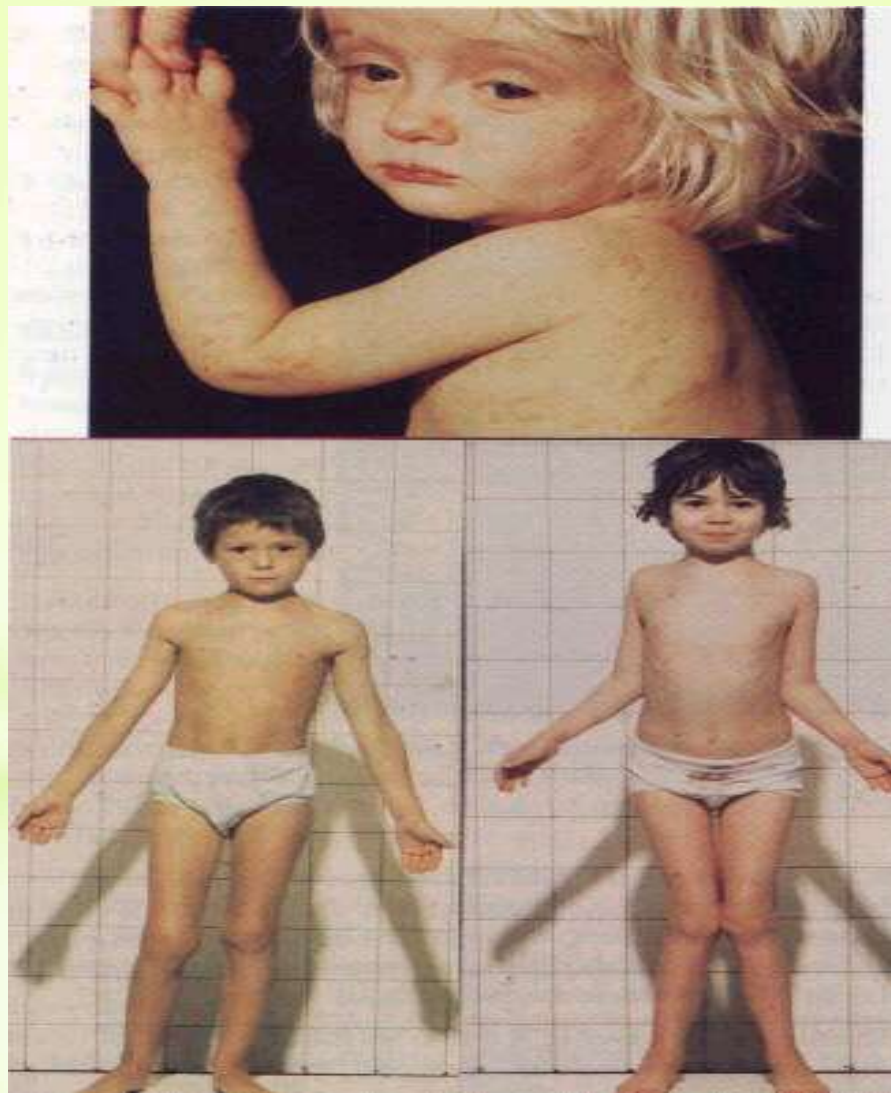
Psoriatic arthritis

(severe psoriasis; sausage shaped fingers and severe nail dystrophy; nail pitting; onycholysis)

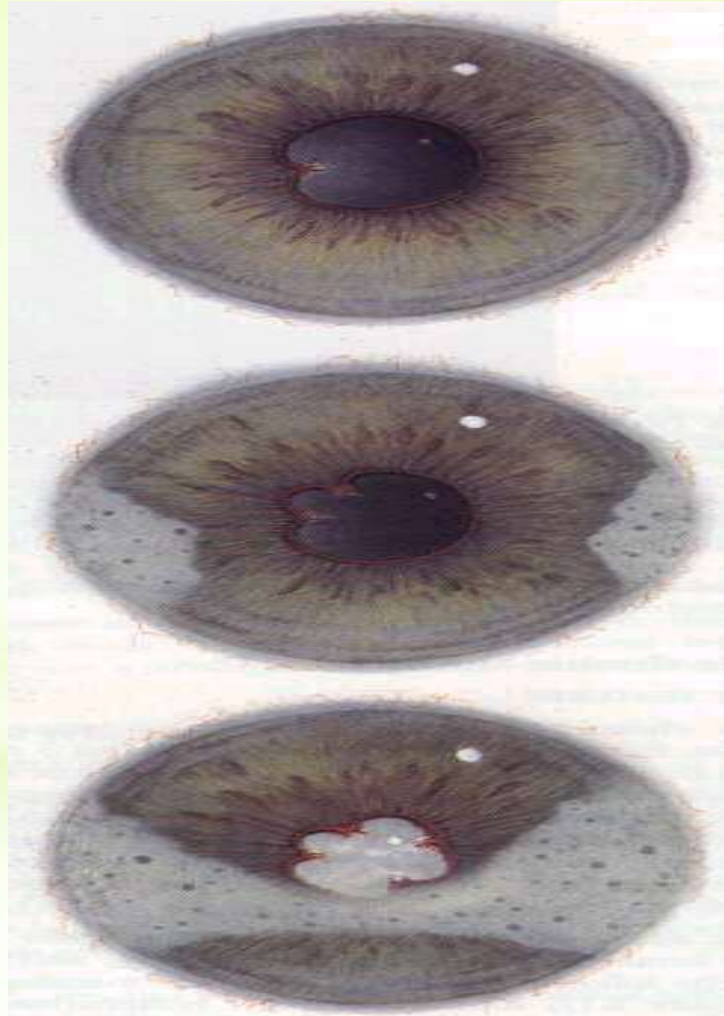


Juvenile chronic arthritis

(Maculopapular rash in systemic onset disease; pauciarticular involvement of right knee: polyarticular disease)



Progression of complications of chronic anterior uveitis associated with juvenile chronic arthritis (a) Posterior synechiae formation; (b) increase in number of posterior synechiae and early band keratopathy; (c) extensive band keratopathy and mature cataract

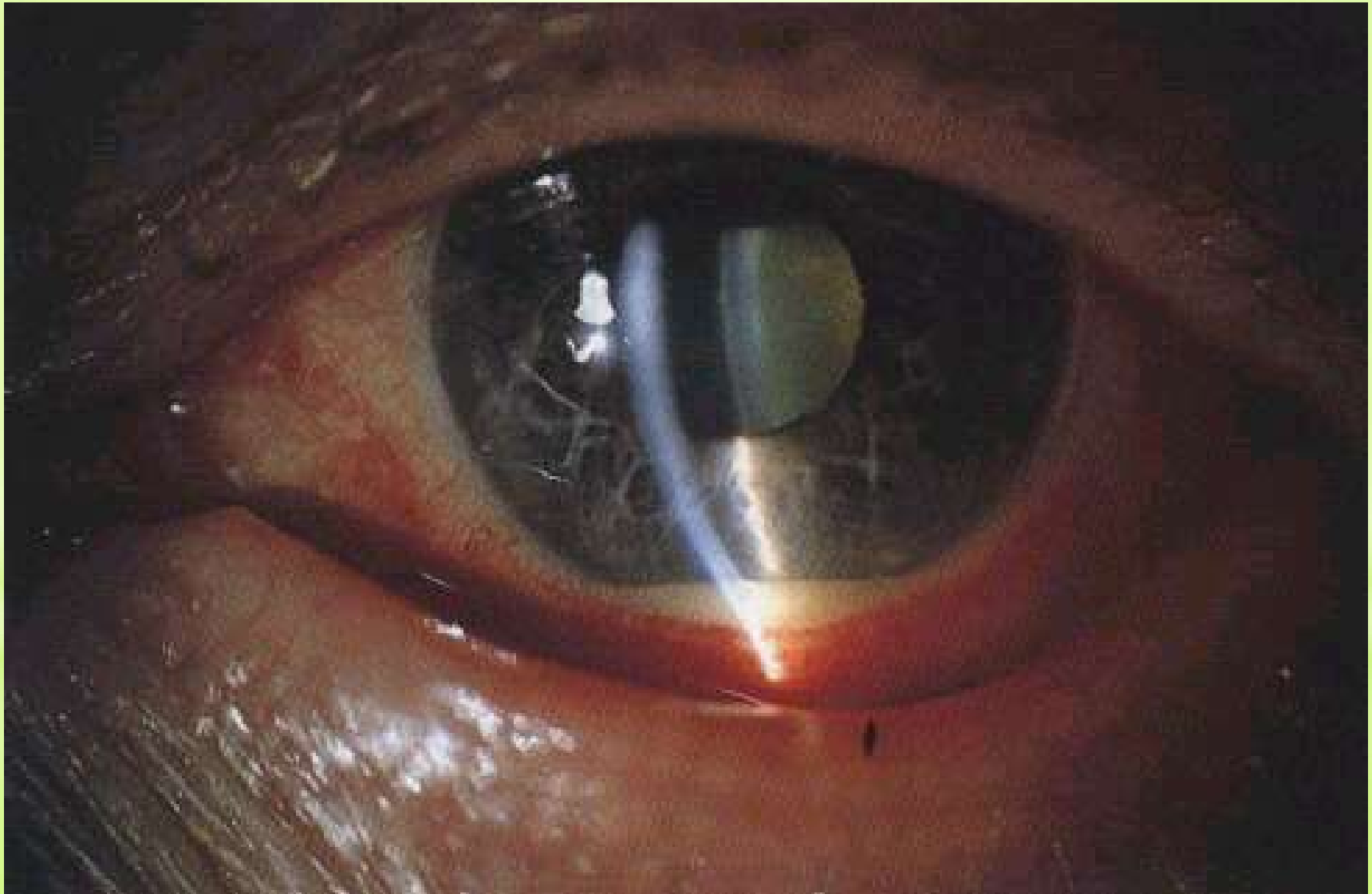


Behçet's disease

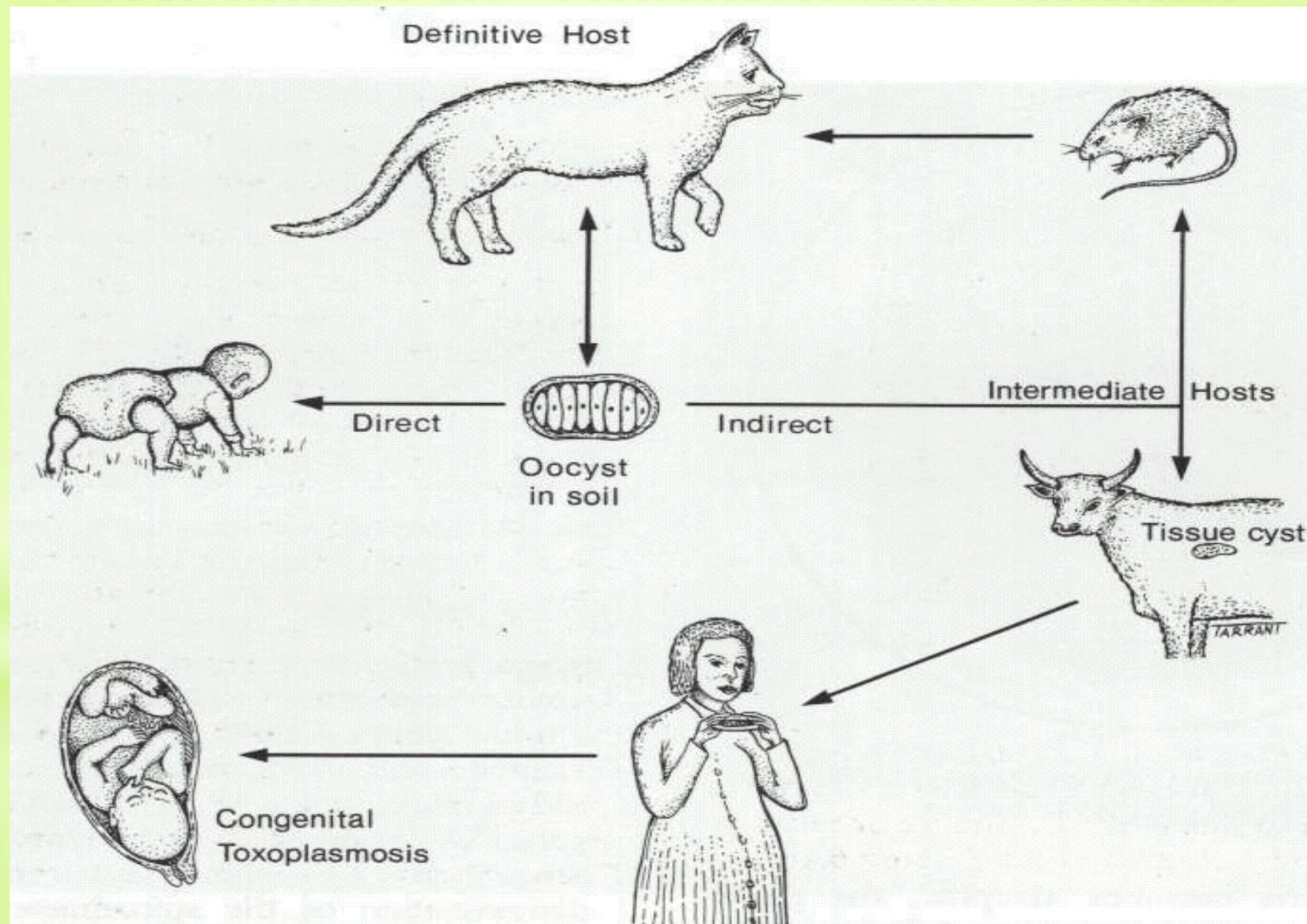
(ulcer of buccal mucosa; ulcer of tongue; genital ulceration; leg oedema secondary to severe thrombophlebitis)



***Hypopyon in anterior uveitis associated
with Behçet's disease***



Life cycle of *Toxoplasma gondii*

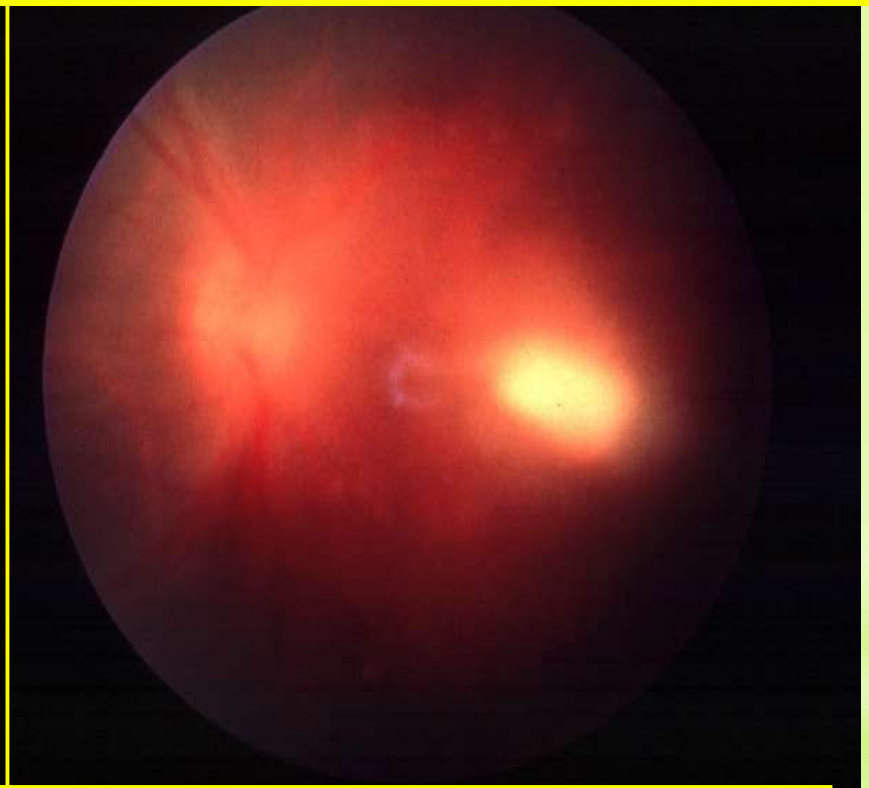


Toxoplasmosis

- **Recurrence of healed congenital lesion**
- **Usually between ages 10-35 years.**

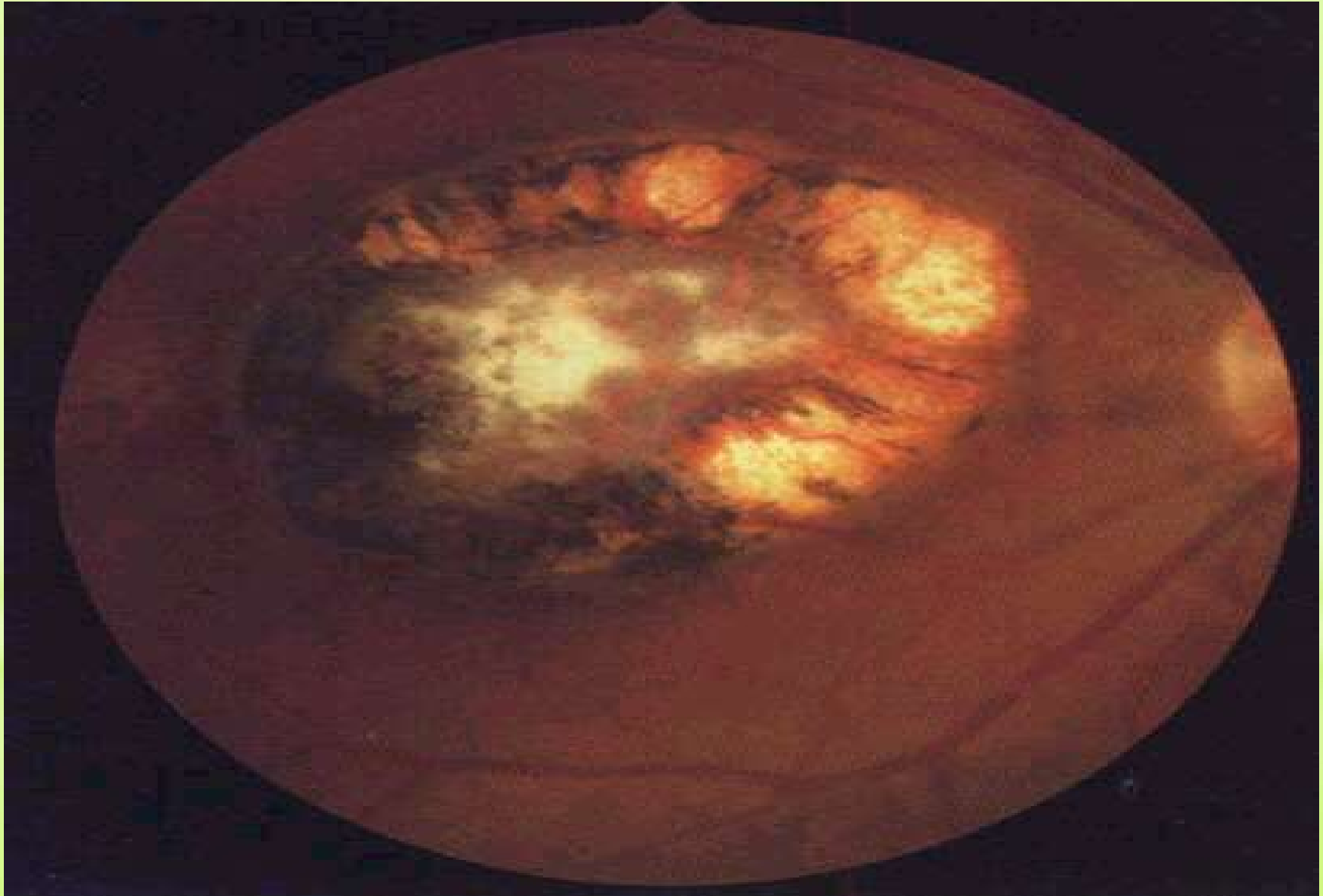


Unifocal retinitis adjacent to old scar
- heals within 1 to 4 months



Vitritis may be severe
- 'headlight in fog'

Macular scar in congenital toxoplasmosis

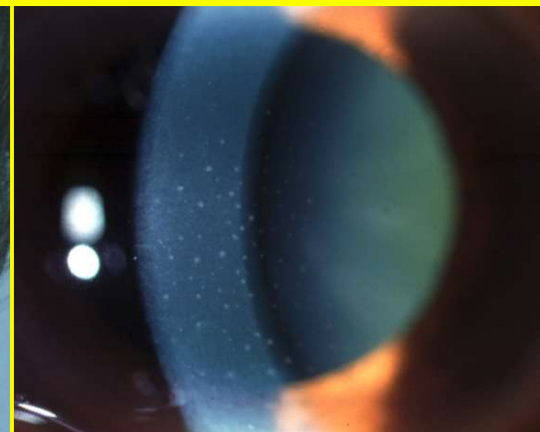


Herpes zoster ophthalmicus

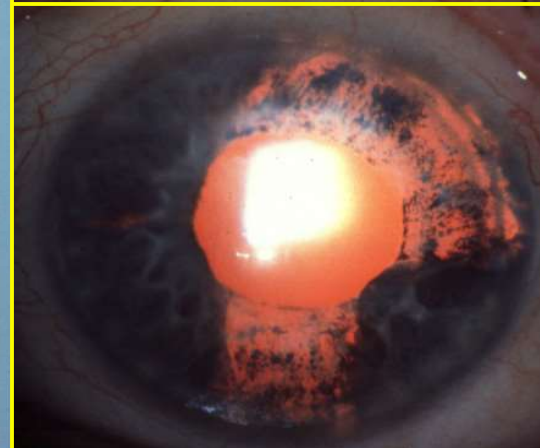
- Iritis in 40% of cases
- Within 3 weeks of onset of rash



Particularly if external nasal branch involved - Hutchinson sign

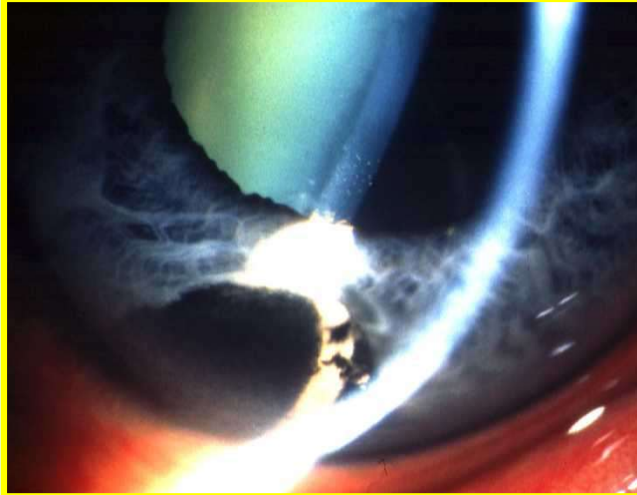


Small-medium KP



Iris atrophy - 20%

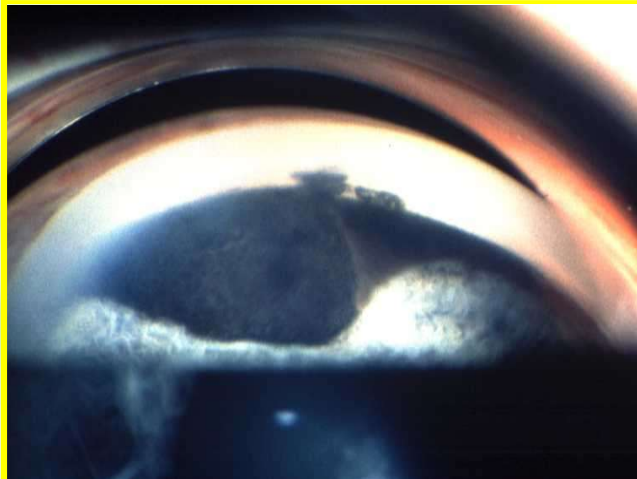
Iris melanoma



- Usually pigmented nodule at least 3 mm in diameter
- Invariably in inferior half of iris



- Occasionally non-pigmented
- Surface vascularization

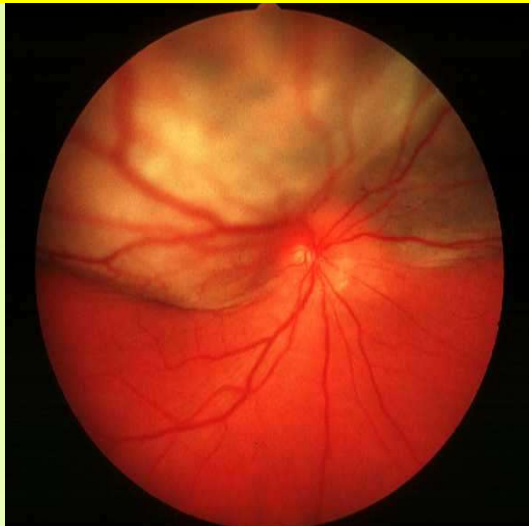


- Angle involvement may cause glaucoma

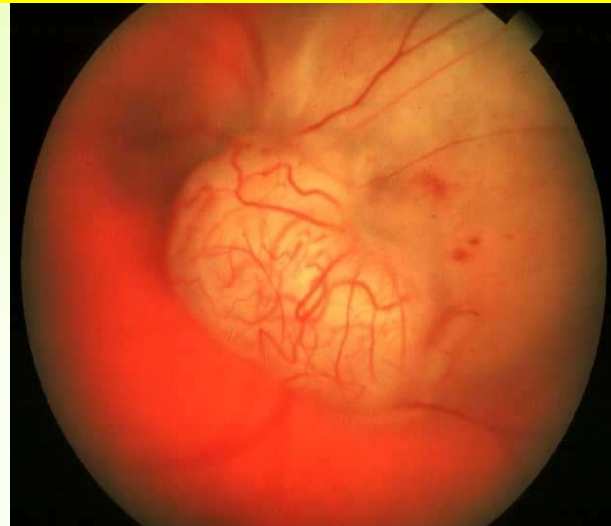


- Pupillary distortion, ectropion uveae and cataract

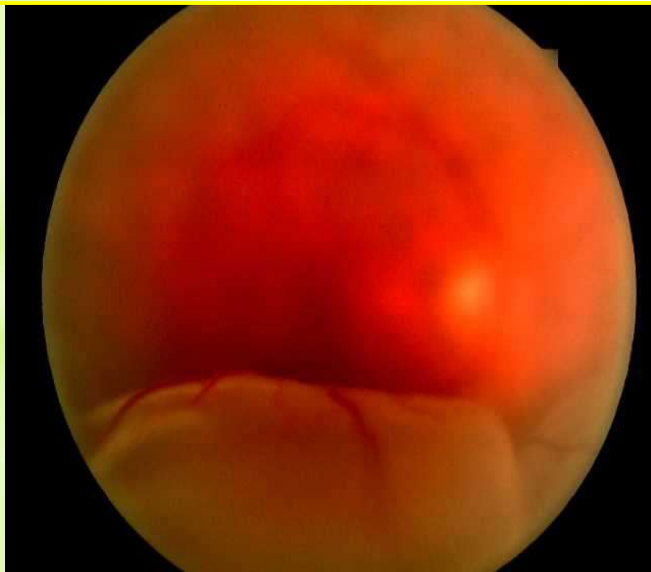
Choroidal melanoma



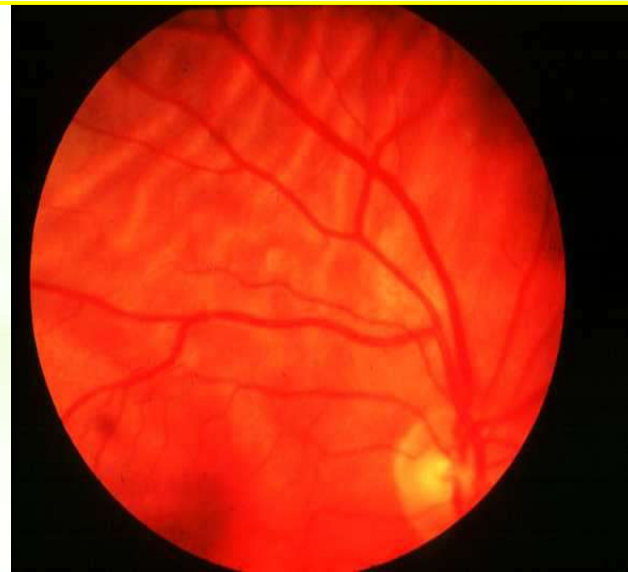
- **Brown, elevated, subretinal mass**



- **Occasionally amelanotic**
- **Double circulation**



- **Secondary retinal detachment**



- **Choroidal folds**

Choroidal melanoma



- Surface orange pigment (lipofuscin) is common
- Mushroom-shaped if breaks through Bruch's membrane



- Ultrasound - acoustic hollowness, choroidal excavation and orbital shadowing

SQUINT

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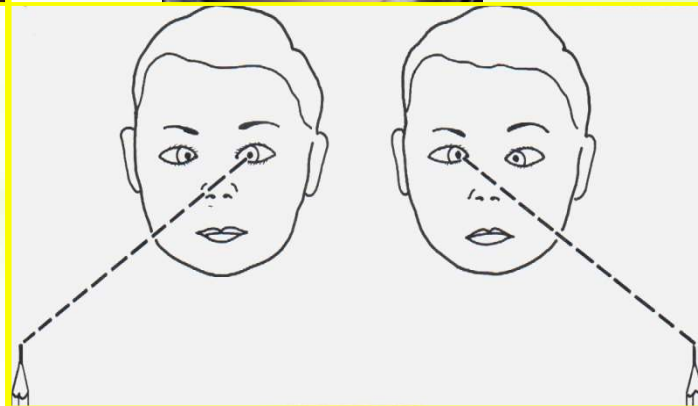
Essential infantile esotropia

Presents within first 6 months

Signs



- Angle large and stable
- Nystagmus in some cases
- Normal refraction for age
- Poor potential for BSV
- Amblyopia in about 30%



• Cross fixation

Management of essential infantile esotropia



- **Correct amblyopia if present**
- **Surgery before age 12 months**



- **Bilateral medial rectus recessions**

Constant exotropia

Congenital



- Presents at birth
- Large angle
- Alternating fixation
- Normal refraction for age

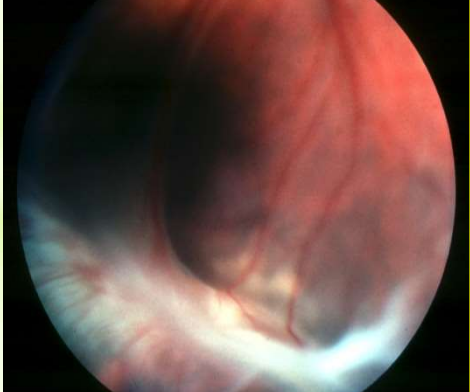
Sensory



- Disruption of binocular reflexes by acquired lesions, such as cataract

Consecutive - follows previous surgery for esotropia

Differential diagnosis of leukocoria

Congenital cataract	Persistent hyperplastic primary vitreous	Inflammatory cyclitic membrane
		
Unilateral or bilateral	Unilateral	Unilateral or bilateral
Coats disease	Posterior pole toxocara granuloma	Advanced retinopathy of prematurity
		
Unilateral	Unilateral	Always bilateral but may be asymmetrical

Presentations of retinoblastoma



• **Leukocoria - 60%**



• **Strabismus - 20%**



• **Secondary glaucoma**



• **Anterior segment invasion**



• **Orbital inflammation**

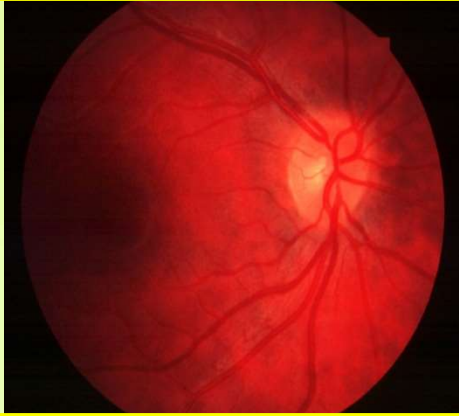
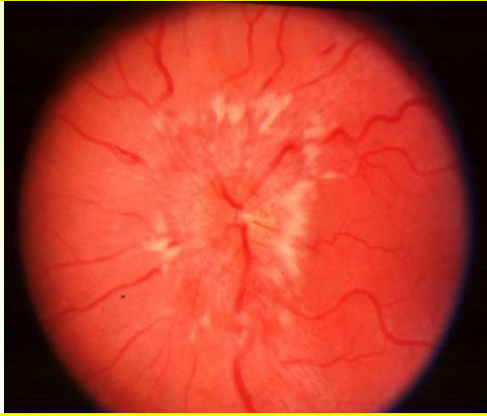
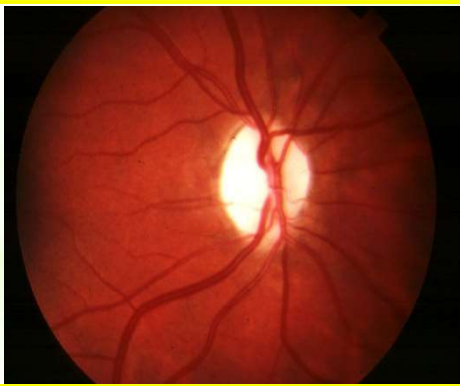


• **Orbital invasion**

NEURO-OPHTHALMOLOGY

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Optic disc changes

Normal	Swelling
	
• Retrobulbar neuritis • Early compression	• Papilloedema • Papillitis and neuroretinitis • AION
	Atrophy
	
	• Postneuritic • Compression • Hereditary optic atrophies

Superficial temporal arteritis



Presentation

- Age - 65-80 years
- Scalp tenderness
- Headache
- Jaw claudication
- Polymyalgia rheumatica
- Superficial temporal arteritis
- Acute visual loss

Special investigations

- ESR - often > 60 , but normal in 20%
- C-reactive protein - always raised
- Temporal artery biopsy

Early Papilloedema



- **VA - normal**
- **Mild disc hyperaemia**
- **Indistinct disc margins - initially nasal**
- **Mild venous engorgement**
- **Normal optic cup**

Established Papilloedema (acute)



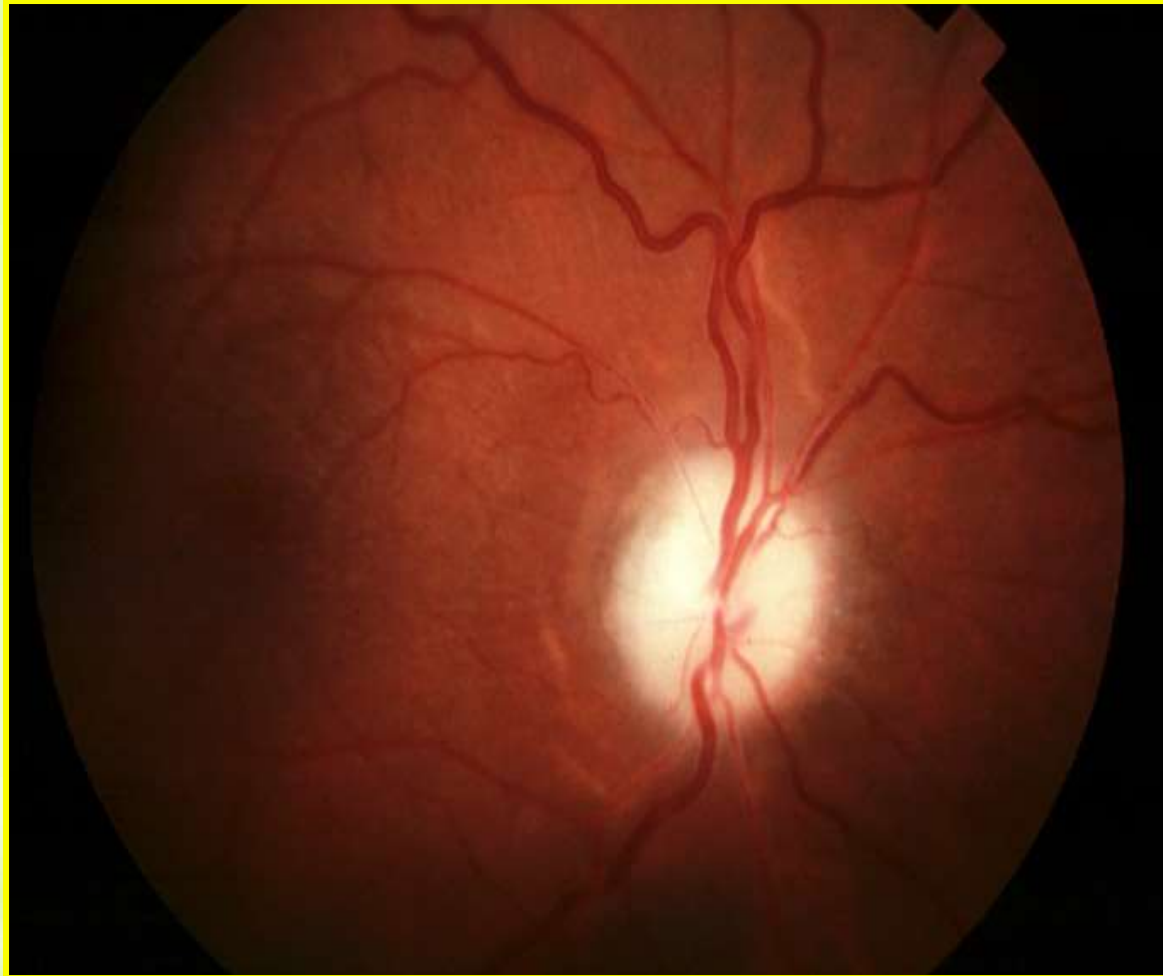
- **VA - usually normal**
- **Severe disc elevation and hyperaemia**
- **Very indistinct disc margins**
- **Obscuration of small vessels on disc**
- **Marked venous engorgement**

Longstanding Papilloedema (chronic)



- **VA - variable**
- **Marked disc elevation but less hyperaemia**
- **Disc margins - indistinct**
- **Variable venous engorgement**
- **Absent optic cup**

Atrophic papilloedema (secondary optic atrophy)



- **VA - severely decreased**
- **Mild disc elevation**
- **Indistinct disc margins**
- **Disc pallor with few crossing vessels**
- **Absent optic cup**

OCULAR TRAUMA

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Orbital floor blow-out fracture



- **Periocular ecchymosis and oedema**
- **Infraorbital nerve anaesthesia**



- **Ophthalmoplegia - typically in up- and down-gaze (double diplopia)**



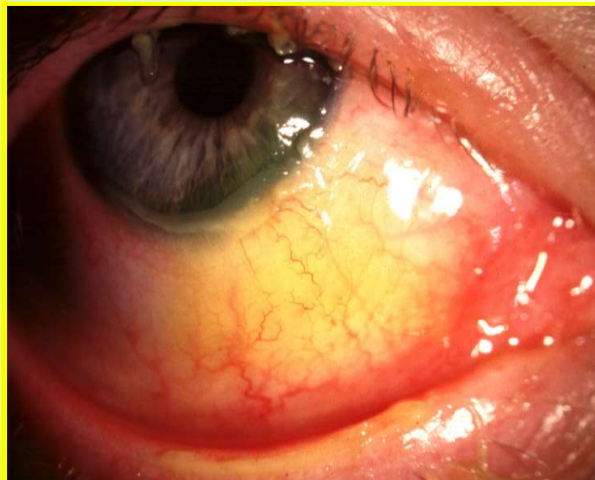
- **Enophthalmos - if severe**

Grading of severity of chemical injuries

Grade I (excellent prognosis)

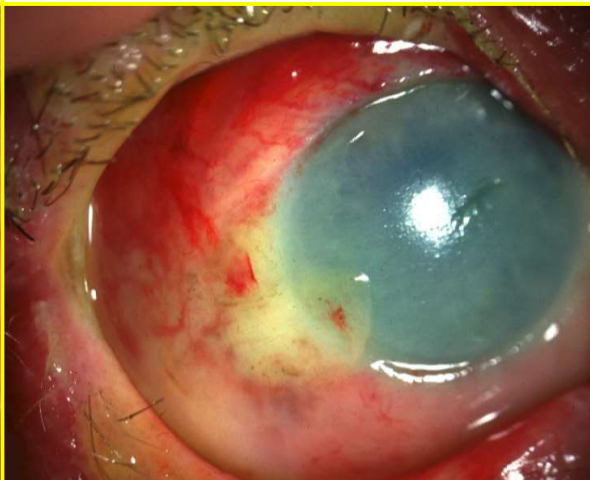
- Clear cornea
- Limbal ischaemia - nil

Grade II (good prognosis)



- Cornea hazy but visible iris details
- Limbal ischaemia $< 1/3$

Grade III (guarded prognosis)



- No iris details
- Limbal ischaemia – $1/3$ to $1/2$

Grade IV (very poor prognosis)



- Opaque cornea
- Limbal ischaemia $> 1/2$

Medical Treatment of Chemical Injuries

1. **Copious irrigation (15-30 min)** - to restore normal pH
2. **Topical steroids (first 7-10 days)** - to reduce inflammation
3. **Topical and systemic ascorbic acid** - to enhance collagen production
4. **Topical citric acid** - to inhibit neutrophil activity
5. **Topical and systemic tetracycline** - to inhibit collagenase and neutrophil activity

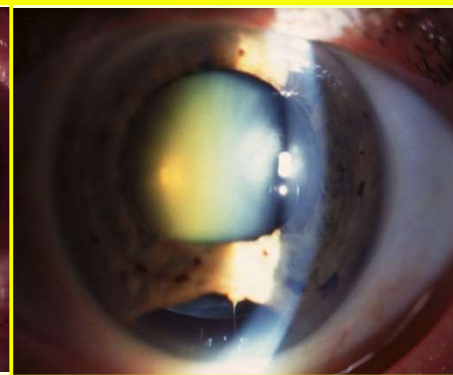
Anterior segment complications of blunt trauma



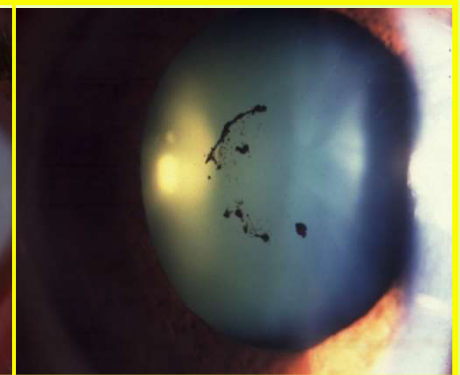
Hyphaema



Sphincter tear



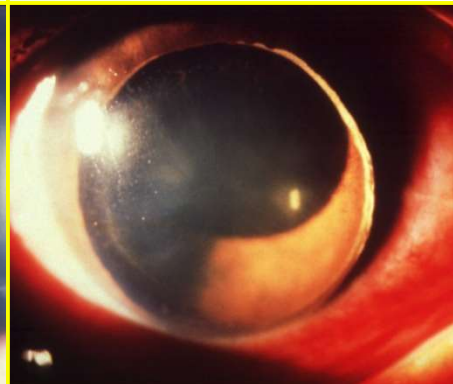
Iridodialysis



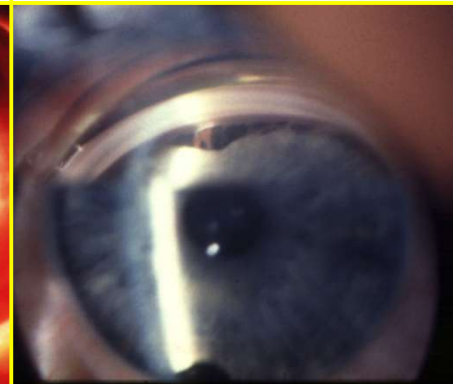
Vossius ring



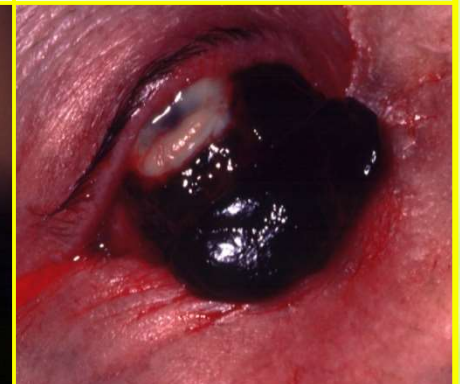
Cataract



Lens subluxation

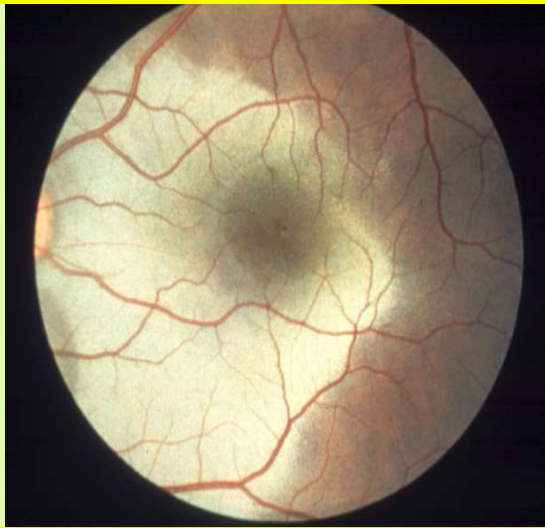


Angle recession

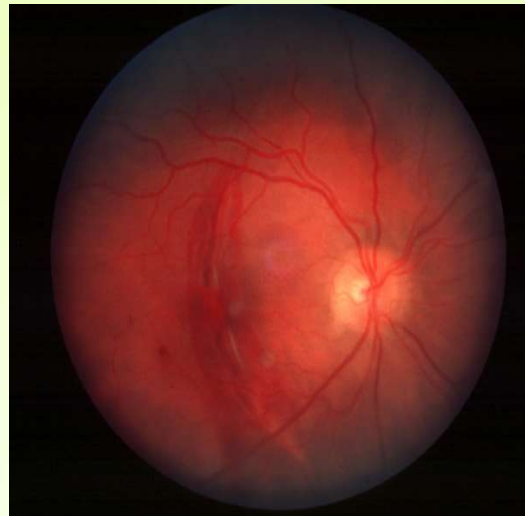


Rupture of globe

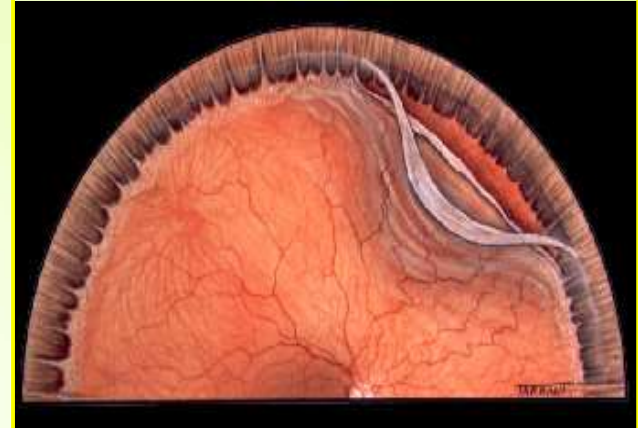
Posterior segment complications of blunt trauma



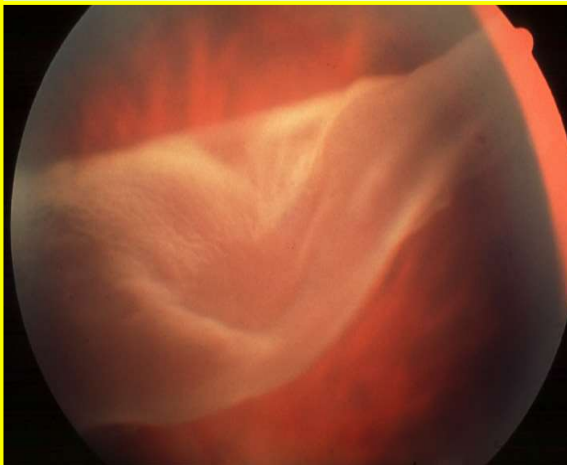
Commotio retinae



**Choroidal rupture and
haemorrhage**



**Avulsion of vitreous base
and retinal dialysis**



Equatorial tears



Macular hole



Optic neuropathy

Complications of penetrating trauma



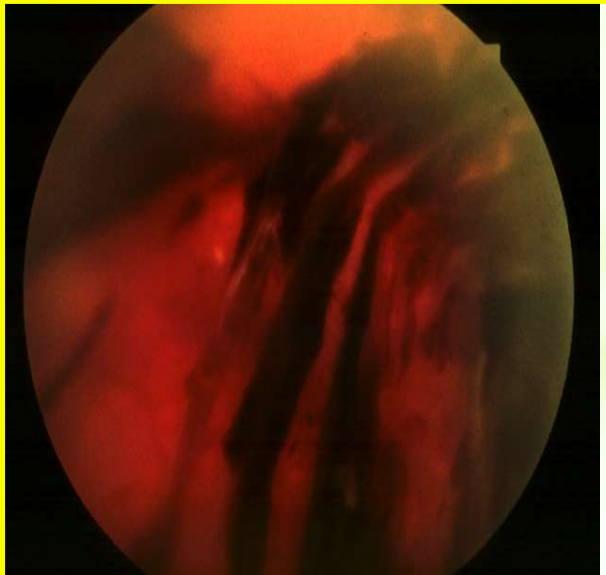
Flat anterior chamber



Uveal prolapse



Damage to lens and iris



Vitreous haemorrhage



Tractional retinal detachment



Endophthalmitis



Belquis Temple in Mareb

THANK YOU